

DRAFT

ENVIRONMENTAL IMPACT STATEMENT

BIG VELVET RANCH GAME FARM EXPANSION

April 1997

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DRAFT ENVIRONMENTAL IMPACT STATEMENT BIG VELVET RANCH GAME FARM EXPANSION

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SUMMARY

The existing Big Velvet Ranch (BVR) proposes to expand its game farm operation in southwestern Montana by adding 1,100 acres. An application to expand the game farm was submitted by BVR in July 1996 to the Montana Department of Fish, Wildlife and Parks (FWP). The FWP determined that an Environmental Impact Statement (EIS) be prepared to evaluate potential human and environmental impacts resulting from the proposed game farm expansion (Proposed Action).

The BVR site is located approximately 5 miles southeast of the town of Darby on the east side of the Bitterroot River valley. The project area generally is located on a south-facing mountain slope along the north side of Rye Creek. The existing BVR operation consists of approximately 2,000 acres that contain about 880 game farm animals (primarily elk with some mule deer and white-tail deer). The expansion area would be used for grazing additional game farm animals and their offspring. These animals would be used for breeding stock, antler production, and shooting operations for paying clients.

PROPOSED ACTION

The BVR proposes to place approximately 300 elk, and possibly 50 mule deer and 10 white-tail deer in the expansion area. A wire mesh perimeter fence around the expansion area would be 9 feet tall. A portion of this fence has been completed; the Proposed Action would require construction of approximately 1 mile of fencing on the north side and 1½ miles on the south side of the proposed expansion area. Two full-time employees would be added as a result of the Proposed Action.

Approximately 500 wild mule deer and other existing wildlife would be removed from the proposed BVR expansion area prior to completion of the perimeter fence. One or two water supply wells would be constructed in the southwest portion of the expansion area to provide water to game farm animals.

The proposed expansion would utilize the existing handling and quarantine area along the south side of Rye Creek. Game farm animals from the expansion area would be routed to a handling facility and quarantine/holding pens along the south side of the expansion area and cross Rye Creek road using the same gates that are used for the existing game farm. No new roads would be constructed in the proposed expansion area. Supplemental feed would be provided for game farm animals in the proposed expansion area.

PROJECT ALTERNATIVES

Two alternatives to the Proposed Action are evaluated in the EIS: (1) Alternative A - Proposed Action with mitigation measures; and (2) No Action Alternative. Under the No Action Alternative, FWP would not issue a license for expansion of the BVR game farm as proposed. Alternative A includes all elements of the Proposed Action modified by the following mitigation measures:

- Implement best management practices (BMPs) for roads and road maintenance.
- Install a double fence around portions of the perimeter of the expansion area.
- Prepare and submit an agency-approved plan addressing animal ingress/egress.
- Fence riparian areas within the proposed expansion area out of the grazing system.
- Transport game farm animals across Rye Creek road by vehicle rather than walking them across the road through a gate.
- Exclude deer from the expansion area.

SUMMARY OF IMPACTS

The following human and environmental resources are described for the study area (Chapter 3) and are evaluated for potential impacts as a result of the Proposed Action (Chapter 4): geology/paleontology; water resources; soil resources; air resources; vegetation; wetland and riparian areas; wildlife and fisheries; threatened, endangered and candidate species; land use; visual resources; social and economic resources; and cultural resources. The impact analysis includes an analysis of direct and indirect impacts, irreversible and irretrievable commitment of resources, and cumulative effects.

The following primary direct and indirect impacts are projected for the proposed BVR game farm expansion (Proposed Action):

- Increased erosion of the land surface would occur in the expansion area from greater animal use and reduction in vegetative cover. As a result, sediment load would increase to streams in the project area. Drainages in the expansion area are relatively small and ephemeral; therefore, increased sedimentation would occur primarily during periods of snowmelt and high rainfall events.
- Over-utilization of vegetation would occur in the expansion area and winter range adjacent to the game farm, resulting in reduced plant vigor, productivity, and cover. Increased soil erosion and weed populations would result from declining native plant populations. Adverse impacts to riparian vegetation and wetland zones would reduce the capacity of these areas to filter sediment from upland sites.
- Approximately 920 acres (54 percent) of the remaining Rye Creek winter range would be fenced by the Proposed Action. As a result, most of the Rye Creek mule deer population would be eliminated due to winter mortality or

special hunts. Additional impacts include increased risk of disease transmission to wild game, increased risk of hybridization in wild game, increased use of agricultural land by wild game, and increased risk of mortality to large carnivores.

- The Proposed Action would increase the frequency and/or duration of closure of the Rye Creek Road due to an increase in game farm elk population and associated crossing of the road between the handling/quarantine area and other pasture areas.
- Positive social and economic impacts of the Proposed Action include: addition of two full-

time employees; increased spending by BVR in the local area for goods and services; and increased personal property tax. Negative social and economic impacts include: adverse effect on quality-of-life of some residents; long-term decrease in big game hunting due to displaced animals; and increased workload for government agency personnel to inspect and monitor the BVR operations.

Cumulative effects of the proposed game farm expansion also would occur for the resources listed above because of other activities that have, are, or will occur in the vicinity of the BVR site. These activities include the existing BVR game farm, timber harvesting on federal and private land, and home building.



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CHAPTER 1

INTRODUCTION

The Montana Department of Fish, Wildlife and Parks (FWP) received an application in August of 1996 to expand the Big Velvet Ranch (BVR) game farm. The BVR is located in Ravalli County, Montana, approximately 5 miles southeast of the town of Darby (**Figure 1-1**). The Proposed Action provides for a 1,100 acre expansion to existing operations. BVR is seeking approval for the expansion permit under Title 87, Chapter 4, Part 4, Montana Code Annotated (MCA).

FWP is the lead agency in preparing this Environmental Impact Statement (EIS) for the proposed project. This document is written in accordance with the Montana Environmental Quality Council's (EQC) Montana Environmental Policy Act (MEPA) Handbook and FWP statutory requirements for preparing an EIS under Title 75, Chapter 1, Part 2 MCA.

This EIS describes the components of, reasonable alternatives to, and environmental consequences of expanding the BVR game farm (Proposed Action). Chapter 1 describes the purpose and need of the game farm expansion, the role of FWP and other governmental agencies having jurisdiction over the Proposed Action, public participation in the EIS process, and issues of concern.

PURPOSE AND NEED

The purpose of BVR's proposal is to expand operations by enlarging the area used to enclose game farm animals and increasing the number of animals contained in the game farm. A description of the Proposed Action and alternatives is provided in Chapter 2 of this EIS. The BVR game farm is a commercial enterprise that provides controlled big game shooting opportunities and is a source of premium elk antlers to world markets. Elk also are sold as breeding stock. The proposed expansion is requested by BVR to meet the needs of game farm shooters for guaranteed kills of bull elk and deer in Montana.

ROLE OF FWP AND OTHER GOVERNMENT AGENCIES

FWP is required to perform an environmental analysis in accordance with MEPA for "each proposal for projects, programs, legislation, and other major actions of state government significantly affecting the quality of the human environment" (Administrative Rules of Montana [ARM] 12.2.430.) FWP's decision options include approving BVR's application (as stated in the Proposed Action) for licensing a game farm expansion, approving alternatives to the Proposed Action which mitigate environmental impacts, approving the Proposed Action or alternatives with conditions to mitigate environmental effects, or denying the license application.

FWP has primary responsibility for the regulation of licensing, exterior fencing, reporting, classification, and general enforcement of licensing violations pursuant to its authority to supervise Montana's fish and wildlife resources in accordance with Title 87, Chapter 4, Part 4, MCA. This law, in combination with FWP requirements described in the *FWP Game Farm Desk Reference* (FWP 1995), require FWP to analyze proposed game farm applications to ensure that:

- 1) A fence is designed to adequately prevent the escape of game farm animals and to prevent the entry of native animal species that are capable of interbreeding with, or contracting diseases or parasites from, the game farm animals.
- 2) Adequate provisions are included to prevent public safety hazards or significant negative impacts to Montana's wildlife resources.

MEPA also provides authority to regulate the environmental impacts of the Proposed Action.

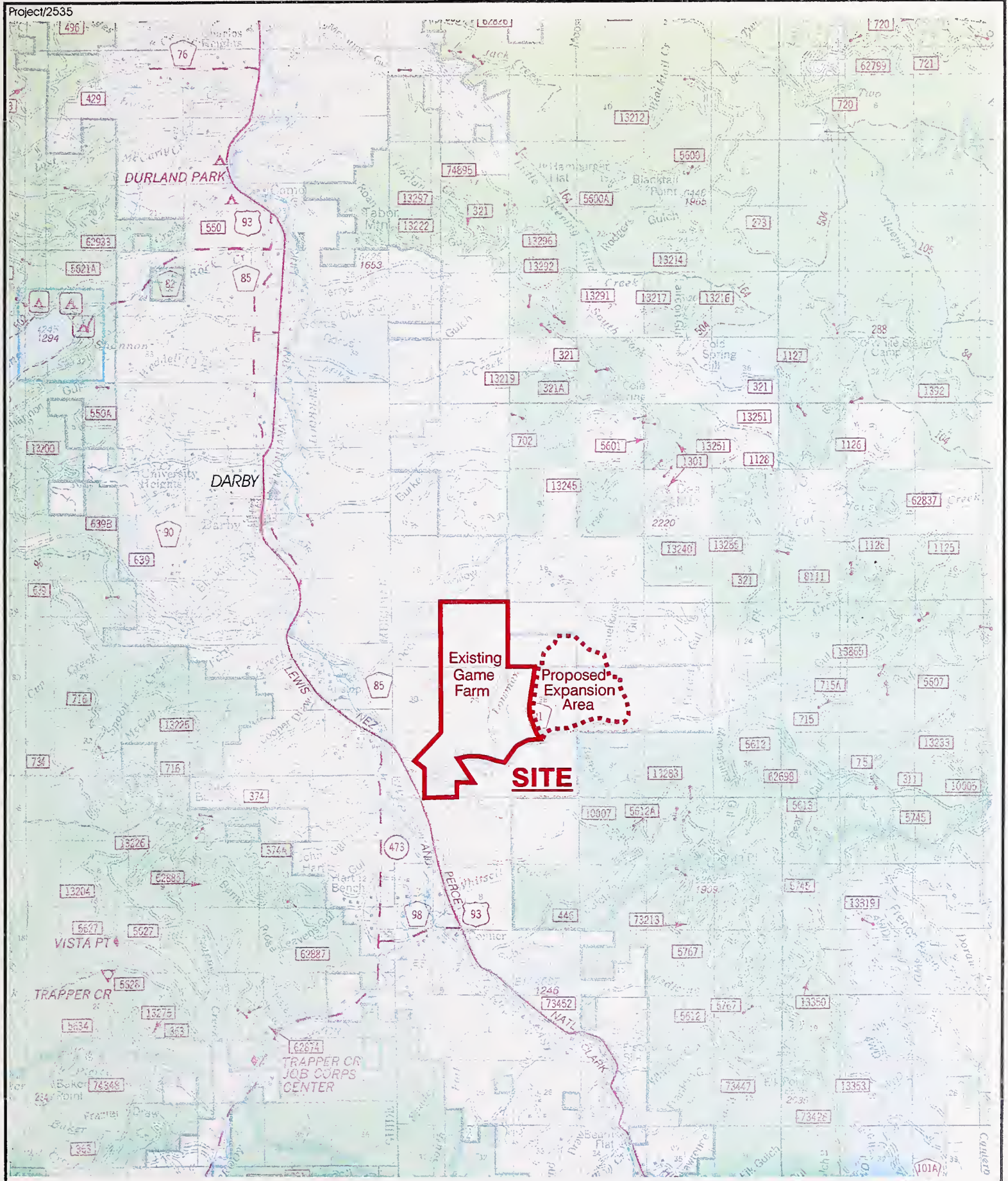
In addition to FWP, the following federal, state, and local agencies have jurisdiction over certain aspects of the Proposed Action:

The Montana Department of Livestock (DoL) is responsible for regulating the health, transportation and identification of game farm animals. During the application process, all applications are submitted to the DoL for approval and inspection of the quarantine facility or quarantine plan. No licenses are issued without such approval and inspection. The DoL issues import permits for animals brought into the state.

The U.S. Army Corps of Engineers (USCOE) is responsible for permitting the placement of any dredged or fill material into the United States' waters or wetlands under Section 404 of the Clean Water Act.

The Montana Department of Environmental Quality (DEQ) is responsible for regulating activities that could affect the quality of state water. A permit from the DEQ is required to construct or use any outlet for discharge of wastes or wastewater into state surface water or groundwater under the Montana Water Quality Act. DEQ also provides exemptions from certain water quality standards for necessary construction or hydraulic projects which may have short-term water quality impacts (i.e., 3A Authorization). Nonpoint discharges from new or increased sources are regulated by DEQ under the nondegradation policy set forth in Title 75, Chapter 5, Part 3, MCA and more generally under Title 75, Chapter 5, Part 6, MCA. Concentrated Animal Feeding Operation (CAFO) permits are issued by the DEQ and include a general discharge permit.

The Montana Department of Natural Resources and Conservation (DNRC) is responsible for regulating water supply well construction and state water rights. BVR must file a notice of completion of any well with the DNRC within 60 days of completion. Water supply wells must be drilled by a contractor or driller licensed by the Board of Water Well Contractors or by a person who has obtained a permit from the board to drill a well on his or her own agricultural property for private use. Any groundwater



From USDA Forest Service Bitterroot National Forest

Location Map
Proposed Expansion EIS
Big Velvet Game Farm Ranch
Ravalli County, Montana
FIGURE 1-1

appropriation that will exceed 35 gallons of water per minute or 10 acre feet of water per year for a beneficial use, or that is inside an established controlled groundwater area, must be permitted by the DNRC before construction can commence.

The Bitterroot Conservation District has jurisdiction over any private, non-governmental individual or corporation that proposes to work in or near a stream on public or private land under the Natural Streambed and Land Preservation Act (i.e., 310 Permit; Title 75, Chapter 7, Part 1, MCA).

The U.S. Department of Interior, Fish and Wildlife Service administers the Federal Endangered Species Act which provides special protection to any species or its habitat if the species is listed as endangered or threatened.

The Ravalli County Weed Control District administers the county weed control plan which specifies recommended practices to prevent the spread of noxious weeds. Weed control requirements are specified in Title 7, Chapter 22, Part 212, MCA.

attended the open house. During the scoping period which included the public meeting, FWP received 30 oral comments and 28 written comments from individuals and persons representing themselves or a group.

ISSUES RAISED DURING THE SCOPING PERIOD

Issues raised in comments are categorized in the following general groups and are summarized as follows:

WATER USE AND WATER QUALITY

- Potential increased sediment load to surface water caused by road building and maintenance
- Potential increased sediment load to surface water caused by loss of vegetation
- Potential damage to riparian and wetland areas caused by game farm animals in the proposed expansion area
- Potential damage to riparian and wetland areas caused by displaced wild game
- Potential impact from increased use of surface water rights

WILDLIFE

- Potential transmission of disease and parasites from game farm animals in the proposed expansion area to wild game due to ingress/egress violations, other game farm/wild game contact or nongame farm animal vectors
- Potential genetic pollution of wild game from game farm animals in the proposed expansion area

PUBLIC SCOPING

A public scoping period has been provided by FWP to allow an early and open process for determining issues related to the Proposed Action. A Notice of Intent to prepare this EIS was published in the Ravalli Republic newspaper on February 14, 1997 and the Missoulian newspaper on February 14 and 15, 1997. Publication of these notices initiated a public scoping period for the Proposed Action that welcomed comments through February 28, 1997.

FWP held a public open house in Hamilton, Montana on February 19, 1997 to present the Proposed Action and record issues and concerns by the interested public. Approximately 60 people

- Potential loss of access to winter range habitat currently used by wild game in the proposed expansion area
- Potential impediments to migration routes of wild game by fencing the proposed expansion area
- Inadequate containment facilities causing illegal ingress and egress of game farm animals and wild game in the proposed expansion area

VEGETATION

- Potential impact to vegetation variety and quantity in the proposed expansion area
- Potential impact to vegetation variety and quantity from displaced wild game in the study area
- Potential increase in weed population in the expansion area and study area

SOCIOECONOMIC CONCERNS

- Adverse impact to sportsmen of the state by damaging the image of hunting and by using fees to pay for EIS process

- Potential impact of expansion to hunting opportunities
- Economic impact to the local community and state
- Potential impact to resources of FWP due to expanded game farm operations

ROADS

- Potential impact to Rye Creek Road from increased runoff and traffic

LIVESTOCK

- Impact to domestic livestock in the area

CUMULATIVE IMPACTS

- The cumulative impact of past, present, and reasonably foreseeable activities to wild game, surface water quality, non-game farm hunting activities, vegetation, wetlands and riparian plant communities, and Rye Creek road

MONITORING

- Presence of wild game in the fenced expansion area
- Number of game farm animals in the expansion area

CHAPTER 2

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

INTRODUCTION

This chapter describes existing operations at the Big Velvet Ranch (BVR) game farm, proposed expansion activities (Proposed Action), and reasonable alternatives to the Proposed Action. The location of the BVR game farm is shown in Figure 1-1.

Alternatives considered in this Environmental Impact Statement (EIS) are based on issues identified by the Montana Department of Fish, Wildlife and Parks (FWP) and public comments received during the public scoping process. The alternatives are intended to reduce or minimize potential impacts associated with the Proposed Action. Chapter 2 includes detailed discussions of the following topics:

- Description of existing BVR operations.
- Description of the Proposed Action (expansion) for the BVR game farm.
- Alternatives to the Proposed Action, including the No Action Alternative.

EXISTING OPERATIONS

This section describes existing operations at the BVR game farm and proposed expansion area including location, land ownership, game farm activities, water supply, and compliance history.

LOCATION AND LAND OWNERSHIP

The BVR game farm is located in southwestern Montana approximately 5 miles southeast of Darby. BVR is located on private land owned by Len and Pamela Wallace and includes the existing game farm, the proposed expansion area, and adjacent undeveloped land that is currently on the

market as 10- to 20-acre subdivided lots. Other communities in the area are Hamilton, approximately 20 miles to the north, and Sula, approximately 15 miles to the south. The BVR game farm is in the Rye Creek drainage which is tributary to the Bitterroot River. Most of the ranch is bounded on the south by a county road (Rye Creek Road), but a 144-acre portion of the game farm is located south of Rye Creek Road (**Figure 2-1**).

LICENSING HISTORY

A total of 1,944 acres of the BVR are currently permitted by FWP for use as a game farm (FWP 1997b). Game farm operations are regulated under State of Montana statutes (Title 87, Chapter 4, Part 4, MCA and Title 81, MCA), and other applicable state and federal regulations. The BVR was originally permitted to operate 6 acres as a game farm in July 1992. The BVR has received approval for four expansions since that time (**Table 2-1**).

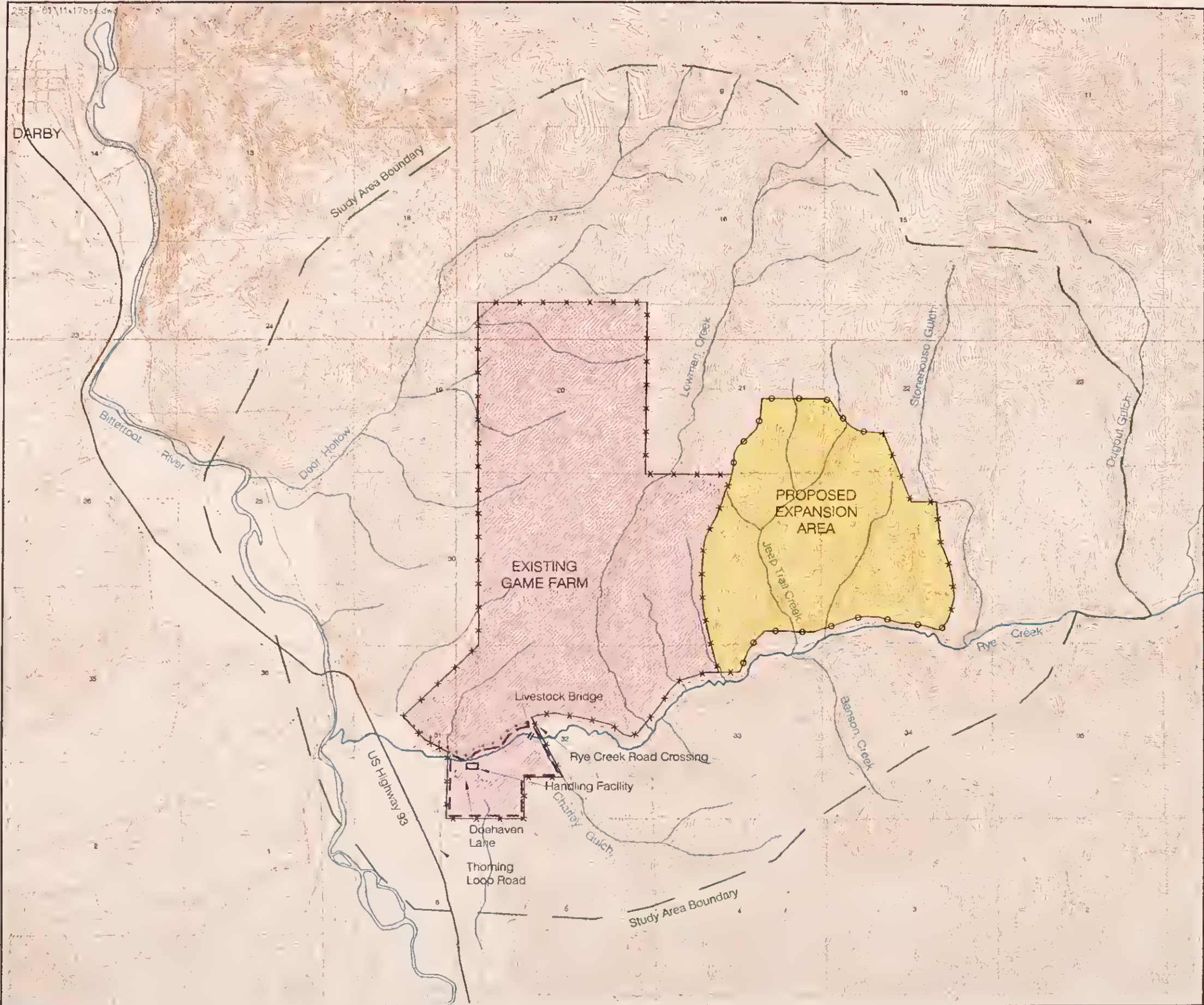
TABLE 2-1		
LICENSING HISTORY OF THE BVR GAME FARM DARBY, MONTANA		
Expansion	Date Approved	Expansion Area
Original Application	July 1992	6 acres
Expansion 1	August 1992	25 acres
Expansion 2	September 1992	13 acres
Expansion 3	April 1993	1,800 acres
Expansion 4	September 1993	100 acres

(Source: FWP 1997b)

CURRENT GAME FARM OPERATIONS

The existing game farm contains approximately 880 game farm animals including 820 elk, 30 mule deer and 34 white-tail deer (DoL 1997a). Domestic animals are imported each year primarily to provide bulls for scheduled shoots. Seventy-eight elk were killed at the BVR game farm during 1996 (DoL 1997b) at an average fee of \$8,000 per kill (BVR 1997a) and 34 elk were sold as breeding stock (FWP 1997a). According to BVR management, approximately 55 percent of the game farm income is from selling breeding stock and approximately 40 percent income is from the shooting operation; 5 percent of annual income is derived from the sale of velvet antlers (BVR 1997b). The BVR game farm currently employs 12 full-time employees and three part-time workers (BVR 1997b).

The game farm is comprised of two distinct areas: (1) 144-acre area containing holding pens, 6 quarantine pens and an indoor handling facility; and (2) 1,800-acre pasture used to contain most of the elk and to conduct shoots (**Figure 2-1**). The 144-acre area is located south of Rye Creek and is divided into approximately 20 pens including 6 handling pens approximately 2,800 square feet each and approximately 20 holding pens ranging from 5 to 40 acres each (DoL 1997c). The handling facility is used for inoculations and tagging (**Figure 2-1**). Game farm animals are transported across Rye Creek Road by means of two 16-foot long gates that swing across the road from the north area of the game farm to join two 16-foot long gates from the southern handling area. The gates are locked together in the center of Rye Creek Road to form a fenced alley way during transfer of game farm



- Proposed Fence
- *-* Existing Fence
- - - Livestock Quarantine Handling And Pen Area



Site Map
Proposed Expansion EIS
Big Velvet Game Farm Ranch
Ravalli County, Montana
FIGURE 2-1

animals from one area of the game farm to the other. The method of transferring game farm animals across Rye Creek road by this gated system is temporarily allowed by DoL and not yet approved for permanent use (**Figure 2-1**).

A fence is in place around the perimeter of the existing game farm and at the eastern boundary of the proposed expansion area (**Figure 2-1**). The perimeter fence is considered an experimental design by FWP and is currently under evaluation for effectiveness. The fence is intended to contain game farm animals, and prevent ingress of wild game into the game farm. The fence is 9-feet tall and constructed of 12½-gauge, high-tensile wire with a vertical mesh of 12 inches and horizontal 6-inch mesh. The top 1 foot of fence is composed of horizontal strands of wire only. The fence around the perimeter of the existing game farm is equipped with electric wiring on both sides. The fence in place at the eastern boundary of the proposed expansion area is not equipped with electric wiring.

Disease Control Procedures

Quarantine facilities are designed to accommodate imported animals and diseased game farm animals. The existing quarantine facilities consist of 6 pens south of Rye Creek Road that will hold 10 to 14 animals each. Because quarantine pens are bounded by wire fences, every other pen must be kept vacant to provide a separation distance between pens when animals of different herds are quarantined. The BVR game farm has a total quarantine capacity of 40 to 56 animals, depending on the size of the game farm animals (DoL 1997c). Disease control procedures in the pasture north of Rye Creek road include capture and destruction of ingressing animals and maintenance of a perimeter fence. Dead game farm animals are buried on site at various locations on the property. According to the DoL game farm animal database, the existing BVR game farm currently has untagged, unmarked deer in the large pasture north of Rye Creek Road. Unmarked deer are the result of either unretrieved deer born in the pasture or ingress animals.

COMPLIANCE HISTORY

The BVR game farm received 131 inspections during 1996 by veterinarians acting as designated agents for DoL. These inspections are paid for directly by BVR. BVR also received two inspections by DoL personnel, and three inspections by FWP personnel in 1996 (DoL 1997d, FWP 1997b). FWP responded to numerous incidents at the BVR game farm in 1996. BVR has received 12 notices of rule and/or statute violations during the period of 1992 through February 1997 (**Table 2-2**).

PROPOSED ACTION

Under the Proposed Action, BVR would continue game farm operations in the existing permitted area and expand into an additional 1,100 acres. The expansion area would be used for grazing game farm animals and their offspring and conducting client shooting trips (BVR 1996).

LOCATION OF PROPOSED EXPANSION

The proposed expansion area is shown in **Figure 2-1** and would encompass 1,100 acres of land east of the existing operation. The expansion area includes most of Sections 28 and 27, the southeast corner of Section 21 and the southwest corner of Section 22 in Township 3 North, Range 20 West (T03N R20W) in Ravalli County, Montana (BVR 1996). The proposed expansion area would be a portion of the BVR game farm which is owned and operated by Len and Pamela Wallace of 137 Doe Haven Way, Darby, Montana (BVR 1996).

REMOVAL OF EXISTING WILDLIFE

Approximately 500 wild mule deer and other existing wildlife would be removed from the expansion area prior to completing the new perimeter fence in accordance with Title 87 Chapter 4 Part 4, MCA (BVR 1997a).

TABLE 2-2
NOTICE OF VIOLATIONS OF FEDERAL AND STATE RULES AND REGULATIONS
BVR GAME FARM 1992 - 1997

DATE	AGENCY	ACTION
1992 - 1997	Montana Department of Fish, Wildlife and Parks	Documented ingress of 20 deer, multiple coyotes, 1 mountain lion, and 1 black bear.
Sept. 9, 1992	Bitterroot Conservation District	Notification to BVR regarding a 310 permit complaint
Feb. 25, 1994	Montana Department of Livestock	"Notice to Appear and Complaint" for failure to notify DoL of change in ownership of a bull elk.
April 18, 1994	Montana Department of Environmental Quality	"Notice of Violation and Order to Take Corrective Action" for violation of 75-5-605 MCA resulting from disturbance and concentration of game farm animals along Rye Creek.
April 28, 1994	Bitterroot Conservation District	"Cease and Desist Order" for failure of four dams on Lowman Creek.
May 4, 1994	Wyoming Fish and Game	Two citations to BVR employee for transporting elk through Wyoming without obtaining proper permits and failure to adequately label containers.
May 5, 1994	Montana Department of Environmental Quality	"Notice of Violation and Order to Take Corrective Action" for violation of 75-5-614(1) MCA resulting from dike failures in Lowman Gulch.
May 9, 1994	Montana Department of Environmental Quality	"Compliance Order" for violation of 75-5-605(1) MCA resulting from disturbance along Rye Creek.
May 9, 1994	U.S. Army Corps of Engineers	Notice of violation of the Clean Water Act (33 USC 1344) resulting from unauthorized construction of four dams on Lowman Creek.
July 17, 1996	Montana Department of Livestock	"Cease and Desist Order" for the use of a handling facility located outside of the perimeter fence of a licensed game farm.
Sept. 17, 1996	U.S. Army Corps of Engineers	Notice requiring additional restoration activities in Lowman Creek drainage; pending violation.
Feb. 27, 1997	Montana Department of Environmental Quality	Notice of violation of Montana Water Quality Act (75-5-605(1) MCA) and for discharging wastes to state waters without a permit (75-5-605(2) MCA). MDEQ requests adequate separation between Rye Creek and animal pens, and submittal of a complete Concentrated Animal Feeding Operation (CAFO) permit.

CONTAINMENT STRUCTURES

Completion of a perimeter fence around the proposed expansion area is the only containment structure included in the Proposed Action. Completion of the fence would require construction of approximately 1 mile of fencing on the north side of the proposed expansion area and 1½ miles on the south side. **Figure 2-1**

shows the location of the existing and proposed fence. The fence would be 9-feet tall and constructed of 12½-gauge high tensile wire. BVR proposes to use a standard fence mesh with horizontal wire spaced 3 inches apart at the bottom and graduate to 7½-inch spacing near the top. Vertical wires in the fence would be at a maximum of 6 inches apart. Fence wire would be 2 inches above ground surface to minimize rust. Barbed wire would be placed at the base of the

fence. The completed fence for the proposed expansion would contain three locked gates (BVR 1996).

The perimeter fence would include line and corner posts spaced approximately 24 feet apart and composed of pressure-treated wood. Corner posts would be 14-foot wood or steel posts set 4½ feet into the ground. BVR proposes to increase the effectiveness of the fence by reducing adjacent slope in steep terrain to 10 percent or less along fence lines (BVR 1996).

GAME FARM ANIMALS

BVR proposes to place approximately 300 elk, and possibly 50 mule deer and 10 white-tail deer in the expansion area (BVR 1996). The number of imported animals placed in the expansion area is not yet known.

WATER SUPPLY

One or two groundwater well(s) would be installed by BVR to supply game farm animals in the expansion area. The well(s) would be installed in the southwest portion of the expansion area near Rye Creek. Water would be temporarily stored in a tank for use by the game animals (BVR 1997a). To mitigate impacts to Rye Creek, the fence would be more than 100 feet from the creek at any point along the expansion area perimeter (BVR 1997a). Rye Creek road is also located between the creek and perimeter fence.

GENERAL OPERATIONS

BVR proposes to use game farm animals placed in the proposed expansion as breeding stock, for antler production and trophy sales (BVR 1996). BVR would adhere to FWP and DoL laws governing the operation of a game farm facility, transportation and disposal, sale of game parts, meats and byproducts, record keeping, and reporting as required under Title 87, Chapter 4, Part 4, MCA and Title 81 MCA.

BVR proposes to provide supplemental feed for game farm animals. Feed would be placed at

least 50 feet away from the perimeter fence (BVR 1997a).

Disease Control Procedures

BVR proposes to use existing quarantine pens in previous licensed areas of the game farm. These quarantine facilities have been approved by DoL for the proposed expansion animals (DoL 1997).

Resource Monitoring

BVR would monitor game farm animals in accordance with Title 87, Chapter 4, Part 4, MCA. No monitoring of environmental resources is proposed (BVR 1996).

ROADS

BVR proposes to use existing jeep trails or roads in the expansion area (BVR 1997a). Most of these roads are located on ridges between drainages. One existing road is located adjacent to an ephemeral stream in the expansion area. Some road maintenance would be required in the expansion area.

EMPLOYMENT

BVR proposes to complete the perimeter fence through contracted services or by hiring temporary employees (BVR 1997a). Two full-time employees would be added as a result of the Proposed Action (BVR 1997b).

PROJECT ALTERNATIVES

FWP rules require the analysis of reasonable alternatives to the Proposed Action including the alternative of no action and other reasonable alternatives that may or may not be within the jurisdiction of the agency to implement (ARM 12.2.436). A reasonable alternative is defined as one that is practical and/or feasible from a technical and economic standpoint.

A reasonable alternative should fulfill the purpose and need of the proposed action and would address significant and relevant issues (EQC 1991).

Two alternatives are evaluated in the EIS: Alternative A - Proposed Action with mitigation measures; and No Action Alternative.

ALTERNATIVE A - PROPOSED ACTION WITH MITIGATION MEASURES

The addition of mitigation measures to the Proposed Action is based on the evaluation of issues of concern described in Chapter 1, impacts identified in Chapter 3, and consequences of the Proposed Action described in Chapter 4. Alternative A includes all elements described in the Proposed Action modified by mitigation measures listed below.

- **Implement erosion control best management practices (BMPs).** Apply BMPs described in the publication Montana Forestry BMPs (MDEQ 1991) to roads and road maintenance activities in the proposed expansion area. These BMPs include specifications for road locations, use of culverts, runoff and sediment control, stream protection by establishing streamside management zones, waste management, and reclamation. These measures would reduce potential impacts to surface water from nonpoint source pollution by reducing erosion and sedimentation from roads in the proposed expansion area.
- **Install a double fence around segments of the expansion perimeter to be determined by FWP.** The perimeter fence around the expansion area would be constructed as described in the Proposed Action; however, part of the expansion perimeter would be contained using a double fence, with a variable minimum fence height depending on terrain and snow accumulation. Both fences would have 60 inch wire mesh running the full height of the fence. The double fence would be constructed of two fences to minimum heights of 9 feet and 10 feet and separated by a distance of 10 to 12 feet. In places where

containment is by a single fence, the fence height would be at least 10-feet. An 8-foot effective height would be maintained around the entire expansion area throughout the year which may require fencing higher than 10 feet in areas of heavy snow accumulation. Locations of double fencing and height of fencing would be determined by FWP. Double fencing may be required around the entire perimeter of the expansion area (except the west side adjacent to the existing game farm).

Installation of a fence around the entire expansion perimeter with 6-inch mesh extended the full height of the fence, a minimum height of 10 feet, and a higher fence in designated areas is designed to mitigate the threat of escape of captive game farm animals and establishment of feral populations that would result in habitat damage, habitat competition, or interbreeding with native wildlife. It would also reduce the threat of ingress events by wildgame. Minimizing ingress\egress events would also reduce the threat of introduction or transmission of serious diseases or parasites to native wildlife populations. The single electrical fence around the perimeter of the existing game farm is a trial design and has been determined to be ineffective and difficult to maintain (FWP 1997b).

- **Prepare and submit an agency-approved Response Plan addressing animal ingress/egress problems.** The Response Plan would address handling procedures for ingress of large carnivores as well as other large wild game. The Plan would be developed by BVR to address issues specified by FWP in the Record of Decision and in accordance with applicable state and federal requirements. This mitigation measure would reduce the threat of introduction or transmission of serious diseases or parasites to native wildlife populations by providing the game farm operator and FWP with specific predictable procedures for managing the ingress/egress of animals through or over containment

structures resulting in additional control of game animal inventory and monitoring. The mitigation measure would also reduce the impact to large carnivores by providing FWP-approved procedural controls over handling of ingressing large carnivores.

- **Fence riparian areas within the proposed expansion area out of the grazing system.** This mitigation measure would significantly reduce the impact to riparian resources by mitigating the impact of vegetation loss and stream bank failure caused by game farm animals. Riparian areas to be fenced and fence design would be determined by FWP based on site-specific conditions.
- **Transport all game farm animals across Rye Creek Road by vehicle** rather than walking them across through a gate. Additional holding and handling facilities near the road crossing site would be required for this mitigation measure. This would reduce the impact to road use and public safety by eliminating the temporary obstruction of public access on Rye Creek Road when the gates are closed across the road, and would reduce the safety hazard of egressing game farm animals to oncoming vehicles. It would also reduce the impact to wildlife by reducing the risk of egress of game farm animals.
- **Exclude all deer from the proposed expansion area.** Deer are difficult to herd and capture from pastures relative to elk. For this reason, new born deer and wild deer left in the expansion area after closure are less likely to be identified and retrieved for tagging and marking. The risk of having unmarked and, therefore, unmanaged deer in the expansion area is eliminated by excluding all deer from the expansion area. With this mitigation measure in place, all untagged and unmarked animals would be considered ingressing animals. This measure would reduce the threat of introduction or transmission of serious diseases or parasites to native wildlife populations by enabling the game farm operator to have tighter inventory control over game farm animals and to more quickly identify ingressing animals.

Mitigation measures described in Alternative A (Proposed Action with mitigation measures) have been developed by FWP and are not part of BVR's expansion proposal. Mitigation or monitoring measures can be required by FWP as a condition or stipulation of approval and authorization (Record of Decision) of the game farm license.

Mitigation Measures Considered But Eliminated

Mitigation measures considered but eliminated are those that are not practical and/or feasible from a technical and economic stand point, or would not fulfill the purpose and need of the Proposed Action, or would not address significant and relevant issues. The following mitigation measures were considered for inclusion in Alternative A, but were eliminated due to the described rationale:

- **Reduce the number of game farm animals proposed to be contained in the expansion area.** This measure would reduce impacts to vegetation in the proposed expansion area and associated increased erosion of the land. It would also reduce the risk of disease transmission to wildlife through egress events. The mitigation measure was eliminated because it would not fulfill the purpose and need of the Proposed Action, and would not effectively address significant issues relative to other mitigation measures described in Alternative A. Damage to vegetation in the expansion area can be reduced but not eliminated by the use of supplemental feed and by protecting riparian areas from animal access. The risk of disease transmission can be more effectively reduced by improved containment structures and herd management practices.
- **Eliminate placement of imported game farm animals in the expansion area.** This mitigation measure would somewhat reduce the risk of disease transmission to and hybridization with wild animals. The measure was eliminated because it is not practical to limit a portion of the BVR game farm to only

those animals born on the game farm while the largest area of the game farm contains imported animals. It is also not feasible to monitor the game farm for compliance with this mitigation measure.

- **Install additional pens to hold game farm animals before using the Rye Creek Road crossing.** This mitigation measure would include the installation of catch pens with perimeter-quality fencing at the southwest corner of the expansion area and in the pen near the Rye Creek Road crossing. The measure would reduce the risk of egress by game farm animals during transfer from one pasture to another across Rye Creek Road, thereby reducing the impact of risk of disease transmission and hybridization to wildlife. It would also reduce the risk of vehicular accidents on Rye Creek Road during herd road crossings. This measure was eliminated from consideration because it would not address a significant issue as effectively as transporting game farm animals across Rye Creek Road by vehicle. In addition, transporting animals by vehicle would require additional holding pens near the vehicle loading site.
- **Create additional winter range habitat on public land to replace winter range lost by implementing the Proposed Action.** Winter range would be created by conducting controlled burns of low elevation areas on Forest Service managed lands in the Rye Creek drainage. Sites to be burned would be ponderosa pine and Douglas fir dominated south slopes. This measure would effectively compensate for the loss of an additional 1,100 acres of mule deer and elk winter range and reduce the substantial loss of critical seasonal game animal habitat. The mitigation measure is eliminated from consideration because it is not technically feasible. This practice has not produced consistent results in the Bitterroot Valley for reestablishing antelope bitterbrush, and reestablishment of browse species can be a slow process (FaunaWest 1997). In addition, there is very little low elevation Forest Service land in Rye Creek that would qualify as potential critical winter range.
- **Plow snow along the fence line.** This

mitigation measure would mitigate the impact to wildlife from ingress/egress events due to inadequate fence height during winter months. The measure was eliminated from consideration because it is not practical from a technical standpoint due to the steep slopes in the area of fencing and the probability that the plowed area would fill in with drifting snow quickly during windy periods. This measure would also not be as effective as the mitigation measure of increasing fence height and installing a double fence.

- **Institute a weed control program.** The weed control program would include the use of weed-free hay, creation of a weed-cleared area outside of perimeter fence, establishment of competitive native grass species on disturbed areas near the fence, and the establishment of biocontrol insects for dominant weed species in fenced riparian enclosures. The weed control program would be developed in conjunction with the local weed control district and the MSU Agricultural Experiment Station personnel at Corvallis. It would also be coordinated with adjacent landowners where possible. This mitigation measure would reduce the impact to vegetation inside and outside of the expansion area from the spread of noxious weeds. This measure was eliminated because weed control at the BVR game farm is already administered by the Ravalli County Weed Control District under the County Weed Control Act, MCA Title 7, Chapter 22, Part 21 and applying different weed control measures in the expansion area than are currently imposed on the existing game farm would have minimal to no impact on the spread of noxious weeds in the study area.

NO ACTION ALTERNATIVE

Under the No Action Alternative, FWP would not issue a license for expansion of the BVR game farm as proposed. Therefore, no game farm animals would be placed on the proposed expansion area. Implementation of the No Action Alternative would not preclude other activities allowed under local, state and federal laws to take place in the expansion area. Impacts of the No Action Alternative are discussed in Chapter 4 for each resource area.

CHAPTER 3

AFFECTED ENVIRONMENT FOR PROPOSED ACTION AND ALTERNATIVES

INTRODUCTION

This chapter describes aspects of the existing environment which are relevant to the issues of concern listed in Chapter 1 and it provides baseline conditions from which to discuss environmental effects. The "expansion area" referred to in this EIS is the 1,100-acre area proposed for the game farm expansion (**Figure 2-1**). The "BVR game farm" refers to the existing game farm as shown in **Figure 2-1**. In this EIS, elk and deer on the outside of the game farm are referred to as *wild elk* and deer, *wildlife* or *wild game*, while those on the inside of the game farm are termed *game farm* animals.

Figure 2-1 shows the study area for most resource investigations associated with the proposed expansion. Study area boundaries for each resource are based on the predicted locations of direct and indirect impacts resulting from the Proposed Action and alternatives. The study area boundary shown on **Figure 2-1** applies to the following resources: water, air, vegetation, wetland and riparian areas and land use resources. The study area boundaries for socioeconomic and wildlife resources extend beyond the boundaries shown on **Figure 2-1**. The study area boundaries for geology, soil, visual and cultural resources are limited to the existing game farm and the proposed expansion area. Livestock is not addressed in this EIS because this resource is not present in the study area. The study area boundary for these resources is described in the text under each resource discussion.

The 11,000-acre study area shown in **Figure 2-1** is comprised of the existing 1,944-acre fenced BVR game farm, the proposed 1,100-acre expansion area, and surrounding winter range. Adjacent drainages surrounding the existing game farm and proposed expansion area include Deer Hollow, Upper Lowman Creek, Stonehouse Gulch, Charley Gulch, and Lower Benson Creek (**Figure 3-1**).

GEOLOGY AND PALEONTOLOGY

The geology and paleontology study area is the area within the existing game farm and proposed expansion (**Figure 3-1**). The study area is generally located on a south-facing mountain slope along the north side of Rye Creek in the eastern half of the Bitterroot Valley. This major valley is a north-south-trending trough in the Northern Rocky Mountains physiographic province and is bounded on the east side by the Sapphire Mountains and on the west by the Bitterroot Mountains. The proposed expansion area ranges in elevation from about 4,000 to 5,500 feet. Most slopes in this area are steep, ranging from about 15 to 70 percent.

The Sapphire Mountains are characterized by steep, but moderately rounded features. Highest elevations in this mountain range extend to approximately 8,800 feet. The Sapphire Mountain front along the east side of the Bitterroot River is very irregular, with a high relief and gently-sloping terraces located adjacent to the river. Much of the mountain surface is underlain by thin rocky soil, but bedrock crops out along the steeper slopes. Streams tributary to the Bitterroot River flow on or close to bedrock.

GEOLOGY

Precambrian-age sedimentary rocks and Cretaceous-age granitic rocks of the Idaho batholith form most of the Sapphire Mountains. The old sedimentary rocks belong to the Ravalli Group of the Belt Supergroup and consist primarily of dark-gray quartzites and argillites. Metamorphic rocks associated with the granite also comprise a portion of these mountains.

Unconsolidated to semiconsolidated Tertiary-age sedimentary rocks constitute most of the valley fill in the project area. This material generally consists of material that has eroded from the mountains and probably is underlain by Belt

Supergroup rocks. Coarse colluvial deposits along the base of the mountains grade into medium- to fine-grained alluvial fan deposits that interfinger with flood-plain and channel alluvium. Average thickness of alluvium in the main portion of the Bitterroot Valley is about 40 feet; whereas, alluvium along tributary channels typically is less than 10 feet (McMurtrey et al. 1972). The modern terraced topography in the Bitterroot Valley is the result of late Tertiary- and Quaternary-age erosion and deposition.

SEISMICITY

A significant fault has been mapped along the mountain front adjacent to the Bitterroot River near the BVR site (McMurtrey et al. 1972). This fault may have developed during emplacement of the Idaho batholith. The undisturbed valley fill shows that post-depositional movement along the fault(s) has been slight or nonexistent.

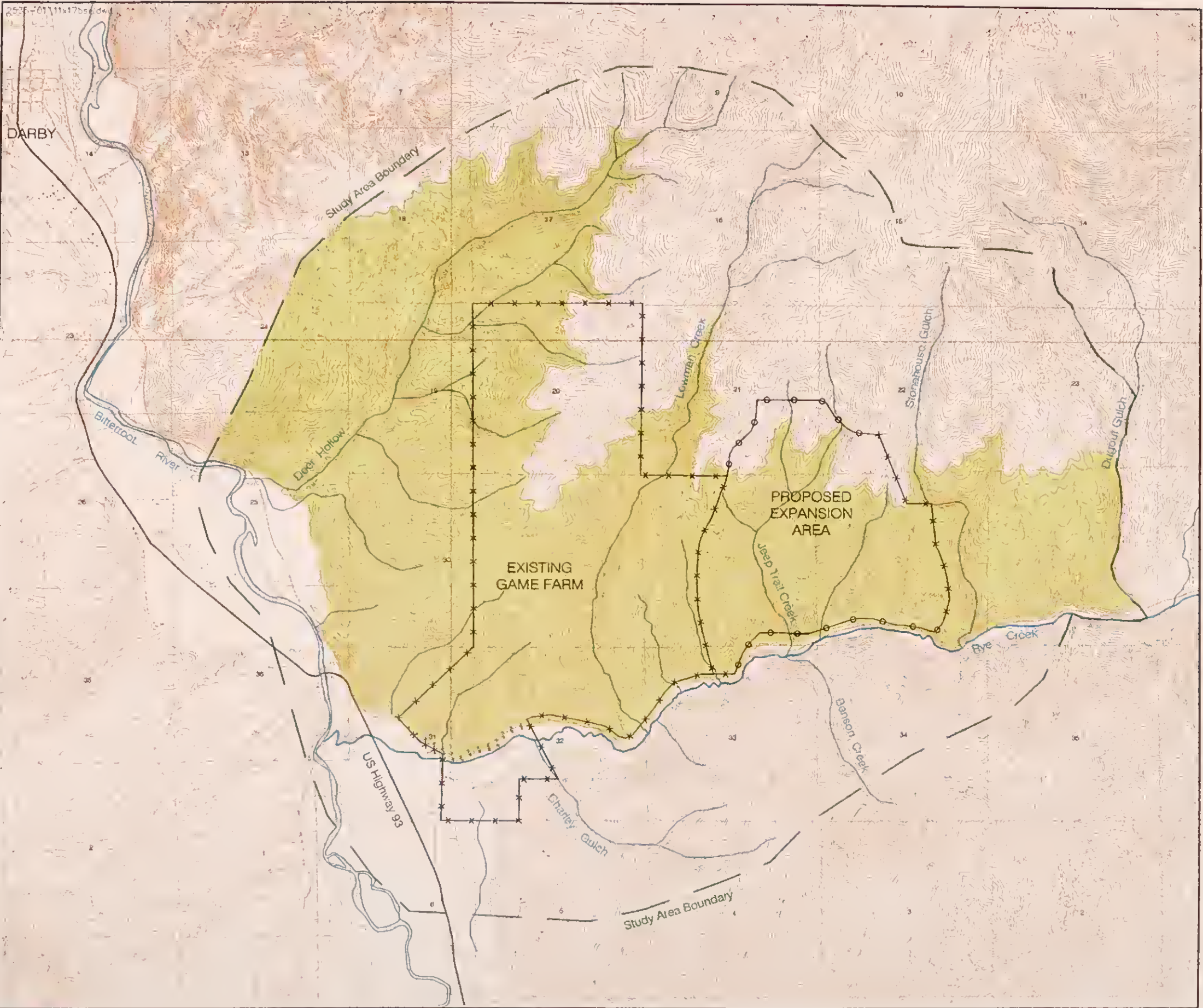
The Bitterroot Valley region has a very low rate of seismicity. No earthquakes having a magnitude of three or more have been recorded in the Bitterroot Valley between the period of 1869 - 1979 (Qamar and Stickney 1983). From 1980 to present, the Bitterroot Valley has had the lowest seismic activity of any area in western Montana and has no confirmed significant historical seismic activity to present (Stickney 1996).

PALEONTOLOGY

No paleontological resources are known to occur within the proposed BVR expansion area. Geologic formations in this area (i.e., Precambrian-age sedimentary rocks and Cretaceous-age granitic rocks) do not contain paleontological resources.

GEOLOGIC RESOURCES

The DEQ Abandoned Mine Reclamation Program maintains an inventory of inactive and abandoned mine sites in Montana. The closest mining district to the study area (Frog Pond Mining District) is approximately 12 miles east of the BVR expansion area (DEQ 1989). There is no record of historic mining or evidence of current hard rock mining in



- Proposed Fence
- ✕—✕ Existing Fence
- Critical Winter Range



Drainages / Critical Winter Range
Proposed Expansion EIS
Big Velvet Game Farm Ranch
Ravalli County, Montana
FIGURE 3-1

the existing game farm or expansion area (Maxim 1997a). An area in the southern portion of the proposed expansion area near the county road has been excavated for gravel and fill material.

WATER QUANTITY AND QUALITY

The surface and groundwater study area is delineated by the study area boundary in **Figure 3-1**.

SURFACE WATER

The BVR site is located in the southern-half (upper portion) of the Bitterroot River drainage basin. This valley extends for a distance of approximately 80 miles from the Idaho border at Horse Creek Pass in the south to the town of Missoula in the north. The Bitterroot River joins the Clark Fork River near Missoula. The proposed BVR expansion area is located approximately 2 miles east of the Bitterroot River in the Rye Creek drainage (**Figure 3-1**).

Rye Creek is a perennial stream (i.e., flows year-round) that drains west to the Bitterroot River through the BVR site. The majority of the BVR site, including the proposed expansion, is located on the north side of Rye Creek. Most of the handling and quarantine pens are located along the south side of Rye Creek approximately one-half mile from the confluence of Rye Creek and Bitterroot River (**Figure 2-1**).

Lowman Creek is the primary stream that drains the existing BVR game farm; this stream is intermittent, with some sections of the stream flowing year-round. For the proposed BVR expansion area, the primary drainage is known as "Jeep Trail Creek"; this is an ephemeral stream (i.e., flows only part of the year, primarily in response to snow melt and heavy rain events). All drainages in the proposed expansion area are ephemeral. Stonehouse Gulch borders the east

side of the expansion area, but does not extend into the expansion area.

There is limited information on water quantity for Rye Creek and its tributaries. The flow rate of Lowman Creek on April 28, 1994 was 337 gallons per minute (gpm) (DNRC 1995). Flow observed in Jeep Trail Creek on February 25, 1997 was an estimated 20 to 40 gpm. Rye Creek upstream from the BVR site near the North Fork Rye Creek confluence was gaged for flow rates by the U.S. Forest Service (USFS) during 1979-80. Flow rates of 9 to 65 cubic feet per second (cfs) were measured during the months April through June (USFS 1997).

Water quality data for upper Rye Creek were collected by the USFS during the periods 1972-73, 1979-80, and 1990. Results show that water in this stream was good quality at that time with the following general characteristics: pH = 7.3 to 8.1 standard units; specific conductance = 35 to 150 micromhos per centimeter; hardness = 12 to 60 milligrams per liter (mg/L); nitrate = <0.01 mg/L; total suspended solids = 3 to 52 mg/L; and water temperature = 38 to 54 degrees Fahrenheit (USFS 1997).

Flow in the Bitterroot River and its tributaries is typical of mountain areas where spring runoff from snowmelt and late spring/early summer rain contribute most of the annual discharge. About 55 percent of total annual flow in the Bitterroot River occurs during May and June (McMurtrey et al. 1972). The U.S. Geological Survey (USGS) measures Bitterroot River flow approximately one-half mile downstream of the Rye Creek confluence (gaging station no. 12344000). The mean annual flow at this gaging site is 876 cfs for period 1937-1995 (USGS 1996). Mean monthly flow of the Bitterroot River for the same period ranges from 250 cfs (January) to 3,056 cfs (June).

Lowman Creek was subjected to erosion and increased turbidity in the spring of 1994 when high runoff flows breached several earthen dams used as watering sites for elk on the existing BVR game farm. The BVR is currently restoring affected areas under the direction of the DEQ and USCOE. Rye Creek is fenced within the BVR area

such that game farm animals cannot directly access the stream; the animals use a bridge to cross this stream.

Quality of water in the Bitterroot River near Darby is good with total dissolved solids less than 100 mg/L and hardness than 70 mg/L (McMurtrey et al. 1972). Streams discharging from the Sapphire Mountains generally have slightly higher concentrations of most constituents than in the Bitterroot River near Darby.

Surface water in the study area is used primarily for irrigation and stock purposes. Numerous water rights have been secured for water in Rye Creek and the Bitterroot River in the study area (see "Water Rights" section). Water rights also have been obtained for Lowman Creek for domestic, stock, and irrigation purposes.

GROUNDWATER

Water from precipitation, irrigation, and losing streams moves down through soil and rock to the groundwater system. Groundwater then generally travels in a lateral direction until it is discharged to the earth's surface through springs, seeps, wells, and gaining streams, or to the atmosphere by evapotranspiration. In the BVR study area, groundwater tends to move in unconsolidated deposits along stream channels and in bedrock along fractures. Groundwater generally moves from the higher mountain areas to the valley bottoms. The Bitterroot River is the primary discharge site for groundwater in the entire valley. In the BVR area, groundwater likely flows south-southwest toward Rye Creek and the Bitterroot River.

All bedrock material in the study area acts as one hydrostratigraphic unit because it has similar abilities to store and transmit water. In general, these rocks are hard, dense, and yield water only from fractures. Most wells that intersect bedrock fractures yield 1 to 10 gpm (McMurtrey et al. 1972). Overall permeability of the bedrock is low; however, these rocks are exposed over large areas and can transmit large quantities of groundwater on a regional basis. Water released from these rocks sustains the flow of many

springs and the base flow of some streams. Groundwater does provide flow to streams in the study area, including Rye, Lowman, Jeep Trail, and Stonehouse creeks.

The most permeable units for movement of groundwater are relatively silt-free sand and gravel lenses in the Bitterroot River channel deposits. Some of the tributary streams also have limited zones of these permeable materials. The finer-grained alluvial fan deposits and flood-plain sediments are relatively impermeable and generally do not yield significant quantities of water to wells.

Depth to groundwater is unknown in the proposed BVR expansion area. Records of water rights in the study area (see "Water Rights" section) show that one well located near the northern end of the proposed BVR expansion area is completed to a depth of 340 feet; this would indicate that depth to groundwater may be relatively deep (i.e., greater than 100 feet) in bedrock in this area. Several wells associated with water rights that are located in drainage bottoms show total depths of about 30 to 60 feet, indicating shallow depth to water.

Quality of groundwater in the general area is good with total dissolved solids and hardness (as CaCO_3) typically less than 200 mg/L (McMurtrey et al. 1972). Nitrate in some shallow wells is elevated (greater than 10 mg/L), possibly due to fertilizers, concentrated animal areas, and/or septic systems.

Springs in the general study area often discharge along the contact between alluvium and Tertiary sediments, or where fractures that transmit groundwater intersect the ground surface. A few springs have been identified in the vicinity of the BVR site based on water rights records (see "Water Rights" section). Two springs in the upper Lowman Creek drainage have water rights; however, the springs are not located within the existing BVR or proposed expansion area. In addition, water rights are claimed on two springs located along the south side of Rye Creek just south of the proposed BVR expansion area.

WATER RIGHTS

Records of water rights obtained from the Montana Department of Natural Resources and Conservation (DNRC 1997a) show that there is considerable water use in the study area. Sources of water include wells, springs, streams, and the Bitterroot River. No water right sources are located within the proposed expansion area. The BVR proposes to install one or two water supply wells for animal use near the southwest corner of the expansion area north of Rye Creek.

The BVR has several existing surface water rights on Rye Creek, Lowman Creek, and the Bitterroot River. In addition, the BVR has groundwater rights associated with two wells near the main ranch house. Other water rights in the study area exist for Rye Creek, Lowman Creek, Deer Hollow, Bitterroot River, springs, and wells. Water rights for sources located within approximately one mile of the proposed BVR expansion area include (all within T03N R20W): two wells in Section 22 - Chief Joseph Ranch, owner; 10 Rye Creek water rights in Sections 27, 28, 32, and 33 - Wallace, owner; one Rye Creek water right in Section 33 - Campbell, owner; one Rye Creek water right in Section 34 - U.S. Department of Agriculture, owner; two Rye Creek water rights in Section 34 - Casto, owner; three Lowman Creek water rights in Sections 29 and 32 - Wallace, owner; one well in Section 32 - Nelson, owner; two groundwater pits in Section 33 - Campbell, owner; two springs in Section 33 - Campbell, owner; and three wells in Section 34 - Casto, owner (DNRC 1997).

deviations from average precipitation are common. The southern Bitterroot Valley receives an average of 50 inches snowfall per year (USDA SCS 1975) and 15 inches average annual precipitation (USFS 1997). More than 25 percent of the yearly precipitation is generally in May and June (McMurtrey et al. 1972).

AIR POLLUTION POTENTIAL

Factors that directly affect air pollution potential are wind speed, mixing height, and atmospheric stability. Atmospheric stability is a measure of the atmosphere's ability to disperse a pollutant. Unstable atmospheric conditions allow maximum dispersion, whereas stable atmospheric conditions represent minimum dispersion. Mixing height is the atmospheric height to which pollutant concentrations are readily mixed or dispersed.

Mixing heights vary daily and seasonally; they are highest during summer afternoons when solar heating is strongest, and lowest during periods of low wind speeds and temperature inversions. The latter conditions (commonly called stagnation episodes) do not occur frequently over extended periods in the Northern Rockies. Temperature inversions occur frequently at night, but they are readily removed by increased wind speeds during the day. The combination of relatively high and persistent wind speeds, unstable atmospheric conditions, and variable mixing heights results in low air pollution potential at the BVR study area.

AIR QUALITY

Air quality in the southern portion of the Bitterroot Valley is rated as "good to excellent" by the Montana Air Quality Division and meets all ambient air standards (Jeffries 1996). The closest air monitoring station to the study area is located in the town of Hamilton. Ambient air in Hamilton is currently monitored for particulate matter less than 10 microns in size (PM-10). Hamilton ambient PM-10 measurements are consistently below the federal and state average annual standard of 50 micrograms per cubic meter (Jeffries 1996).

AIR RESOURCES

The study area for air resources is delineated by the boundary shown in **Figure 3-1**.

ATMOSPHERIC CONDITIONS

The Bitterroot Valley is characterized by mild winters, cool summers, light precipitation, and very little wind (McMurtrey et al. 1972). Wide

SOIL RESOURCES

The soil resources study area includes the existing game farm and the proposed expansion area (**Figure 3-1**). A soil resource technical report describing soil conditions at the study area in more detail is on file at the FWP offices in Missoula and Helena (Maxim 1997b). Three soil associations have been mapped in the study area by the Soil Conservation Service (SCS) of the USDA: 1) Brownlee-Stecum Association; 2) Woodrock Association; and 3) Alluvial land and valley slopes (USDA SCS 1959). A general description of these soil types including physical and chemical data were obtained from the Natural Resource Conservation Service (NRCS 1997). Data from the USDA include the following information:

- Map unit (association by major and minor series), percent of map unit (comprised by each soil series).
- Taxonomic class, family, parent material, landform, slope.
- Surface characteristics, dominant vegetation, range site, soil depth.
- Permeability, drainage, runoff, erosion hazard, available water capacity.
- Topsoil characteristics.

The Brownlee-Stecum Association is the predominant soil mapping unit in the proposed expansion area occurring in more than 90 percent of the study area. The Woodrock Association occurs on slopes greater than 25 percent and is found in approximately 2 percent of the study area. Alluvial land and valley slope soils occur in 5 to 8 percent of the study area within the valley bottom of Rye Creek.

Soil in the study area is derived primarily from weathered granitic bedrock. The easily weathered parent material and steep slopes have resulted in

shallow soils in the range of 10 to 20 inches thick. The upper soil horizon contains a low to moderate amount of organic matter and a coarse sandy loam to loam texture. Permeability is moderate to moderately rapid and soil moisture holding capacity is relatively low.

Slopes in the study area are moderately steep, averaging 45 percent and ranging from 15 to 70 percent. Slope lengths in the proposed expansion area range from 125 feet to over 600 feet; slopes vary from gently sloping along the ridge tops above the major drainages in the proposed expansion area to steep (35 to greater than 70 percent) along the side slopes of the drainages.

SOIL ERODIBILITY

Soil erodibility from runoff in the study area is moderate. The Revised Universal Soil Loss Equation was developed by the Soil and Water Conservation Society to develop an estimate of soil loss for various conditions of study area soils based on soil characteristics and observations of range condition (Maxim 1997b). Parameters used to evaluate soil loss include:

- rainfall
- soil erosion characteristics
- surface water runoff potential
- soil texture
- slope percent
- slope length
- vegetation production, type and composition
- canopy cover
- rock cover
- organic matter
- ground roughness

Total estimated soil loss by erosion under existing conditions ranges from 0.55 to 6.3 tons per acre per year depending on values assigned to the variables listed above (Maxim 1997b). Maximum average annual erosion from study area soils that can occur without affecting soil productivity is estimated to be 2 tons per acre per year (NRCS 1997). Soil in the study area is characterized as ranging from slightly to highly erodible by wind (NRCS 1997).

LAND USE SUITABILITY LIMITATIONS

The NRCS (1997) provides road placement guidance based on soil types. Limitations to road building suitability in the study area are shallow depth to bedrock (requires blasting and a larger area of disturbance), low soil strength resulting in moderate to high erodibility, and steep slopes (NRCS 1997).

Soil in the study area is classified as providing only poor to fair yield of forage or forage products with severe risk of damage if used for pasture or forest. Alluvial land is in a capability class that is unsuitable for cultivation but has little risk of damage if used for pasture or forest (USDA SCS 1959).

VEGETATION

REGIONAL VEGETATIVE COVER

The vegetation study area (**Figure 3-1**) is located in the Bitterroot Valley section of the Middle Rocky Mountain Steppe Province Subregion (coniferous forest; alpine meadow). The potential natural vegetation for the Bitterroot Valley Section is Douglas-fir and ponderosa pine forest (80 percent), and foothills prairie (20 percent). Common tree species in this section include western larch, Douglas-fir, subalpine fir and ponderosa pine. On good condition rangeland, grassland species are primarily rough fescue, bluebunch wheatgrass, and Idaho fescue (USFS 1994; NRCS 1997).

STUDY AREA VEGETATIVE COVER

Five main vegetation cover types within the study area were identified during field reconnaissance (Durran 1997): wetland/riparian; shrubland; grassland; coniferous forest; and agricultural. Wetland/riparian vegetation is present along the Bitterroot River, Rye Creek, Lowman Creek, Jeep Trail Creek, Deer Hollow, and intermittently in the

unnamed small drainages that dissect the study area. The Bitterroot River and lower Rye Creek are dominated by black cottonwood and aspen, with an understory of shrubs which included willow species, red-osier dogwood, chokecherry, and rose species. Sedge species, Kentucky bluegrass, redtop, and smooth brome are present along the river channel and cattail dominated backwater and seep areas. Upper Rye Creek, and smaller drainages are dominated by willow, red-osier dogwood, chokecherry and rose species, with intermittent black cottonwood and aspen. Aspen occurs around seeps and springs at higher elevations.

Shrublands occur primarily on southerly aspects. Immediately adjacent to the river bottom, slopes are dominated by antelope bitterbrush with an understory of spotted knapweed, cheatgrass, and sparse bluebunch wheatgrass, prairie junegrass, and Sandberg's bluegrass. Mid-to-upper elevations are dominated by big sagebrush, with lesser amounts of antelope bitterbrush and rubber rabbitbrush. Understory species are primarily spotted knapweed and cheatgrass, with lesser amounts of bluebunch wheatgrass, prairie junegrass, Sandberg's bluegrass, and Idaho fescue. Rocky outcrops at mid-elevation are populated by mature stands of mountain mahogany. Range site data indicate that south facing slopes north of Rye Creek are classified as shallow 15- to 19-inch precipitation zone (NRCS 1997).

Coniferous forest is present at mid-to-upper elevation on southerly exposures, and at all elevations on northerly exposures. Ponderosa pine is present in moderate amounts at mid-elevation, with Douglas-fir dominating upper elevations on southerly exposures, and on all northerly exposures. Understory species vary with canopy cover and aspect. Where canopy cover is open, understory species consist of spotted knapweed, Idaho fescue, bluebunch wheatgrass, and prairie junegrass. Northerly slopes have higher tree density and resulting heavier canopy cover. Understory species include white spirea, current, snowberry, and Idaho fescue, with lesser amounts of bluebunch wheatgrass, prairie junegrass, spotted knapweed

and a variety of other forbs. Logging was evident throughout the study area in Douglas-fir and ponderosa pine forest. Recently logged areas in Sections 21 and 22 (T03N, R20W) were not accessible during the site visit. Approximately 200,000 board feet (BF) of Douglas-fir and ponderosa pine were logged in and adjacent to the proposed expansion area in 1995 (BVR 1997a). An additional 15,000 BF of black cottonwood were logged adjacent to Jeep Trail Creek (BVR 1997a).

Grassland is present in small amounts immediately adjacent to Rye Creek and its tributaries, and on north slopes intermingled with Douglas-fir forest. Grassland along Rye Creek and its tributaries is primarily cheatgrass and spotted knapweed. In wetter areas, smooth brome and Kentucky bluegrass are present. North slopes are dominated by Idaho fescue, spotted knapweed, prairie junegrass, and bluebunch wheatgrass.

Soil Conservation Service data indicate both upland soil types within the study area are rated at capability class VII, indicating that these soils are at severe risk of damage if used for pasture or logging (USDA SCS 1959).

Agricultural land is present along the Bitterroot River and Rye Creek. Hayfields and/or pasture dominated by domestic species such as alfalfa, smooth brome and Kentucky bluegrass occur along both drainages. Several of the BVR containment pens along the south side of Rye Creek had no vegetation, or supported only cheatgrass, spotted knapweed, and other weedy forbs. Rye Creek has been fenced out of the BVR game farm, and a narrow band of riparian vegetation is present along this drainage within the study area.

There is abundant bare ground and actively eroding soils within the study area, primarily on steeper south-facing slopes occupied by the shrubland cover type, and in disturbed riparian/wetland areas. Shrubs on elk and deer wintering range outside the existing game farm are severely hedged, with many decadent plants present. Shrubs along Rye Creek, Bitterroot

River, and in the coniferous forest appear to be less hedged, indicating less wildlife use. Within the existing game farm, shrubs are either very decadent or dead, native vegetation is generally sparse, and spotted knapweed is more visible.

Weeds

Three Montana State listed Category 1 noxious weeds, and one noxious weed under consideration for state listing are known to occur within the study area. Category 1 weeds within the study area are spotted knapweed, leafy spurge, and sulphur cinquefoil (provisional, Stepper 1997). Spotted knapweed is ubiquitous throughout the study area and abundant in the BVR game farm and proposed expansion area. In the Rye Creek drainage, some herbicide application for leafy spurge and sulphur cinquefoil has occurred on neighboring ranches (Bower 1997). The BVR does not presently, nor has historically, engaged in any weed control activities (BVR 1997a; Bower 1997; Day 1997).

Elk utilize spotted knapweed on the BVR game farm (BVR 1997c). Under natural conditions, elk will eat spotted knapweed when the nutrient content is high compared to other available vegetation (early spring), or when forage is scarce (winter). When spotted knapweed is utilized, elk and deer select the basal leaves which contain significantly more protein than the dry, brittle flower stalks (FWP 1981). Spotted knapweed does not comprise a large percentage of an elk's diet (Thompson 1997). At the Threemile Wildlife Management Area in the Bitterroot Valley, elk utilizing winter range fed primarily on herbicide treated grasslands and avoided feeding in knapweed dominated sites (Thompson 1996).

Approximately 2,000 acres of land infested with blue thistle occur in the Rye Creek drainage. Blue thistle is relatively new to Montana, but has infested thousands of acres in Canada. Blue thistle prefers dry, steep, disturbed slopes, such as those that characterize the slopes north of Rye Creek within the study area. Herbicide application methods are not reliable, making containment of this weed uncertain at this time (Day 1997; Stepper 1997). There are presently

no biocontrol agents available for blue thistle (Story 1997).

WETLAND AND RIPARIAN AREAS

Wetland areas were estimated based on existing vegetation and known streamflow period along four streams within the study area (Deer Hollow, Lowman Creek, Jeep Trail Creek, and Rye Creek) that appear to have jurisdictional wetlands based on U.S. Army Corps of Engineers (USCOE) criteria. No attempt was made to quantitatively delineate wetlands within the study area based on jurisdictional wetland criteria (USCOE 1987). A total of 2.5 acres appear to qualify as jurisdictional wetlands along these drainages within the study area.

WILDLIFE AND FISHERIES

The wildlife and fisheries study area includes the area delineated by the study area boundary (**Figure 3-1**) and the Rye Creek watershed. The study area shown in **Figure 3-1** contains the core area of critical big game winter range for deer and elk herd segments using upper Rye Creek and the Sapphire Mountains. Wild mule deer and elk also move into and out of the study area on a seasonal basis.

Information on fish and wildlife was obtained from the USFS, U.S. Fish and Wildlife Service

(USFWS), FWP, and Montana Natural Heritage Program. The Montana Natural Heritage Program produced a list of Threatened, Endangered, and Sensitive species which have documented occurrence near the study area, and those species likely to occur within the general area. The USFWS provided a list of Threatened and Endangered (T&E) Species which it considers potentially impacted by this project, and FWP provided a list of fish and wildlife game species which are concerns of the agency.

A field reconnaissance of the study area was made on February 25, 1997 (FaunaWest 1997). During this reconnaissance, the BVR game farm and associated handling facilities, proposed expansion area, and adjacent lands were inspected for the potential presence of big game species, wildlife species of special interest and concern, and federally listed T&E Species.

The wildlife and fish species included in this evaluation have been identified for one or more of the following reasons: the species or its habitat is known or is likely to occur in the study area; the species or its habitat may be affected by the Proposed Action or alternatives; the species or its habitat has been raised as an issue during public scoping; or species must be addressed as directed by law or policy (i.e., T&E Species).

Big game, game bird, and game fish species occurring in this area that are recognized by FWP as species of concern include the mule deer, white-tailed deer, elk, moose, blue grouse, and west slope cutthroat trout. Concern for these species was expressed during the scoping period because: potential blocking of access to critical winter range and migration routes; loss of nesting cover; and sedimentation and significant loss of water quality in lower Rye Creek and the Bitterroot River. A summary of game birds and mammals in the study area is provided in **Table 3-1**.

TABLE 3-1
OCCURRENCE OF GAME BIRDS AND MAMMALS IN THE STUDY AREA
BVR GAME FARM EXPANSION

Species	Occurrence in Study Area	Comments
Elk	yes	Winters on Rye Creek winter range
Moose	yes	Winters along Rye Creek
Mule Deer	yes	Winters on Rye Creek winter range; also present in summer and fall.
White-tailed Deer	yes	Few deer along Rye Creek
Bighorn Sheep	no	Habitat in study area not suitable
Mountain Goat	no	Habitat in study area not suitable
Black Bear	yes	Present on Rye Creek winter range during spring, may use bottomlands during late summer and fall
Mountain Lion	yes	Associated with big game occurrence
Blue Grouse	yes	Study area is spring and summer habitat
Spruce Grouse	unknown	Uses high elevation coniferous habitats
Ruffed Grouse	unknown	Uses aspen and willow habitats
Shaded cells indicate that this species is not present at significant numbers in the study area and will not be discussed in Chapter 4.		

WILDLIFE HABITAT

The Sapphire Mountains provide habitat for a variety of game birds and mammals (Table 3-1). In general, these species are highly mobile and undergo seasonal migrations to key areas for wintering, breeding, birthing (nesting), and summering. Migrational routes taken by these species tend to follow specific topographic and habitat features and use of these areas are fairly consistent between years. Habitat sites critical to the success of wild game populations are characterized by having southern exposures, seeps, wallows, mineral rich soils, ridge tops, saddles, and riparian zone vegetation.

Winter range in the study area includes the lower portion of Rye Creek (and its tributaries - Stonehouse Gulch, Jeep Trail Creek, and Lowman Creek) and Deer Hollow Creek between the

elevations of 4,000 feet (valley floor) and 6,000 feet. The predominant aspect of slopes in this area is southeast to southwest (Figure 3-1).

Prime winter range is critical to the survival of big game animals and other wildlife species. Critical winter range is defined as having southern exposures at low elevations relative to the surrounding region and, as such, provides a micro-climate that is considerably more mild than that of the general area (FaunaWest 1997). Less snow accumulates, and snow melt and spring green-up occurs earlier on winter range slopes. Reduced snow depth improves travel conditions for ungulates (less energy expenditure) and increases accessibility of forage plants and browse. In addition, winter range areas support shrub-grassland communities comprised of vegetation that is suitable for grazing or browsing. The importance of winter range extends well into

spring when succulent grasses and forbs growing on southern exposures provide pregnant female big game species a source of high protein forage that is necessary to carry them through the last phases of gestation.

The study area critical winter range delineated in **Figure 3-1** is at elevations below 5,000 feet with southern exposures. During winters with heavy snow fall (for example 1996-97), these slopes accumulate less snow and may even lose their snow cover during periods of warmer weather. Study area winter range slopes are dominated by big sagebrush, antelope bitterbrush, and bunchgrasses (see "Vegetation" section). The shrubs are an important forage component because they generally remain above the snow cover and are available as browse throughout the entire winter period.

The areal extent of accessible winter range in the study area can be expected to vary between years and even within a year (FaunaWest 1997). During winters with below average snow cover, for example, the winter range may extend up to 6,000 feet. However, winter range areas below 5,000 feet are predictably accessible to wintering deer and elk in all years.

The study area contains all of the mule deer and elk winter range for the Rye Creek and Deer Hollow watersheds. The Deer Hollow winter range was included in the Wildlife study area because it represents a stable winter range habitat for mule deer in the vicinity of the Proposed Action. The Deer Hollow winter range is at capacity (saturated) but can support its current population of mule deer (FWP 1997c).

The Rye Creek and Deer Hollow critical winter ranges together comprise approximately 5,510 acres (**Figure 3-2**). The Deer Hollow winter range, is approximately 2,420 acres. The Rye Creek winter range is approximately 3,090 acres in size, 45 percent of which is within the BVR existing game farm, leaving approximately 1,690 acres of critical winter range available to Rye Creek wildlife. A summary of winter range size and mule deer populations is presented in **Table 3-2**.

The Deer Hollow mule deer herd migrates to the Deer Hollow winter range from locations west and east of the Deer Hollow basin and are not currently impeded by the existing game farm (FWP 1997c). The Deer Hollow herd is currently in a stable state such that available browse is adequate to support the present herd, but an increase in herd size could not be supported over a period of several years. Four hundred and eleven deer currently utilize the Deer Hollow winter range (FWP 1997d). Based on acreage of the Deer Hollow critical winter range and current mule deer population, the density of the Deer Hollow mule deer herd is approximately 0.17 mule deer per acre (6 acres per deer).

The Rye Creek mule deer herd migrates to the Rye Creek winter range from the Sapphire Mountains east of the BVR game farm. The most recent count of the Rye Creek mule deer herd is 860 (FWP 1997d). Of those, 755 mule deer were counted in the area east of the existing game farm. Most of these deer were displaced when BVR fenced the 1,800-acre expansion area in 1993 and have not migrated to other winter ranges (FWP 1997c). Mule deer counted in the Rye Creek winter range located west of the existing game farm are believed to have migrated both from the Deer Hollow and the Rye Creek watersheds (FWP 1997c).

Based on historical mule deer utilization of Deer Hollow winter range (0.17 mule deer per acre density), winter range throughout the study area is estimated to support a mule deer population density of approximately 6 acres per mule deer for extended periods of time (greater than 5 years). Winter range is capable of supporting much denser populations of mule deer for periods of time less than 5 years, if winters are not severe (FWP 1997c; FaunaWest 1997). After several years of browsing by populations of mule deer denser than 0.17 mule deer per acre, the base vegetation tends to be consumed as it has been in the winter range east of the existing game farm. Once the base vegetation is consumed, the winter range is unable to regenerate adequate growth to support even very low concentrations of mule deer.

TABLE 3-2
SUMMARY OF MULE DEER POPULATION STATISTICS IN STUDY AREA

Winter Range	Approximate Acreage	Percent ¹	Approximate Number of Wild Mule Deer	Density of Wild Mule Deer (Ratio of mule deer:acres)
Rye Creek/west of BVR ²	170	6	105	0.61
Existing BVR game farm	1,400	45	0	0
Proposed Expansion area	920	30	620	0.67
East of proposed expansion	600	19	135	0.22
Total Rye Creek	3,090	100	860	0.27
Deer Hollow winter range	2,420	0	410	0.17

¹ Percent of total Rye Creek critical winter range
² Utilized by Deer Hollow and Rye Creek herds
Source: Nielsen 1997c, FWP.

BIG GAME

Elk

Use of the study area by elk is generally from late fall through early spring (FWP 1997b). During the remainder of the year, elk seek higher elevations with greater conifer cover and may migrate up to the Sapphire divide. Generally, elk calve in late May and early June during their seasonal upward migration. During calving, pregnant cows seek seclusion in areas of dense conifer cover and rejoin their herd shortly after calving. Elk return to the winter range in late fall when heavy snow cover prevents them from effectively foraging through the snow.

Deer and elk use of critical winter range in the Rye Creek watershed during the past 8 years has been recorded by FWP using early winter helicopter aerial surveys (FWP 1997d). The Rye Creek winter range receives consistent and considerable use by elk. A recent survey of Rye Creek winter range determined that 105 wild elk (77 females, 16 calves, and 12 males) were present on critical winter range within the proposed expansion area (FWP 1997b).

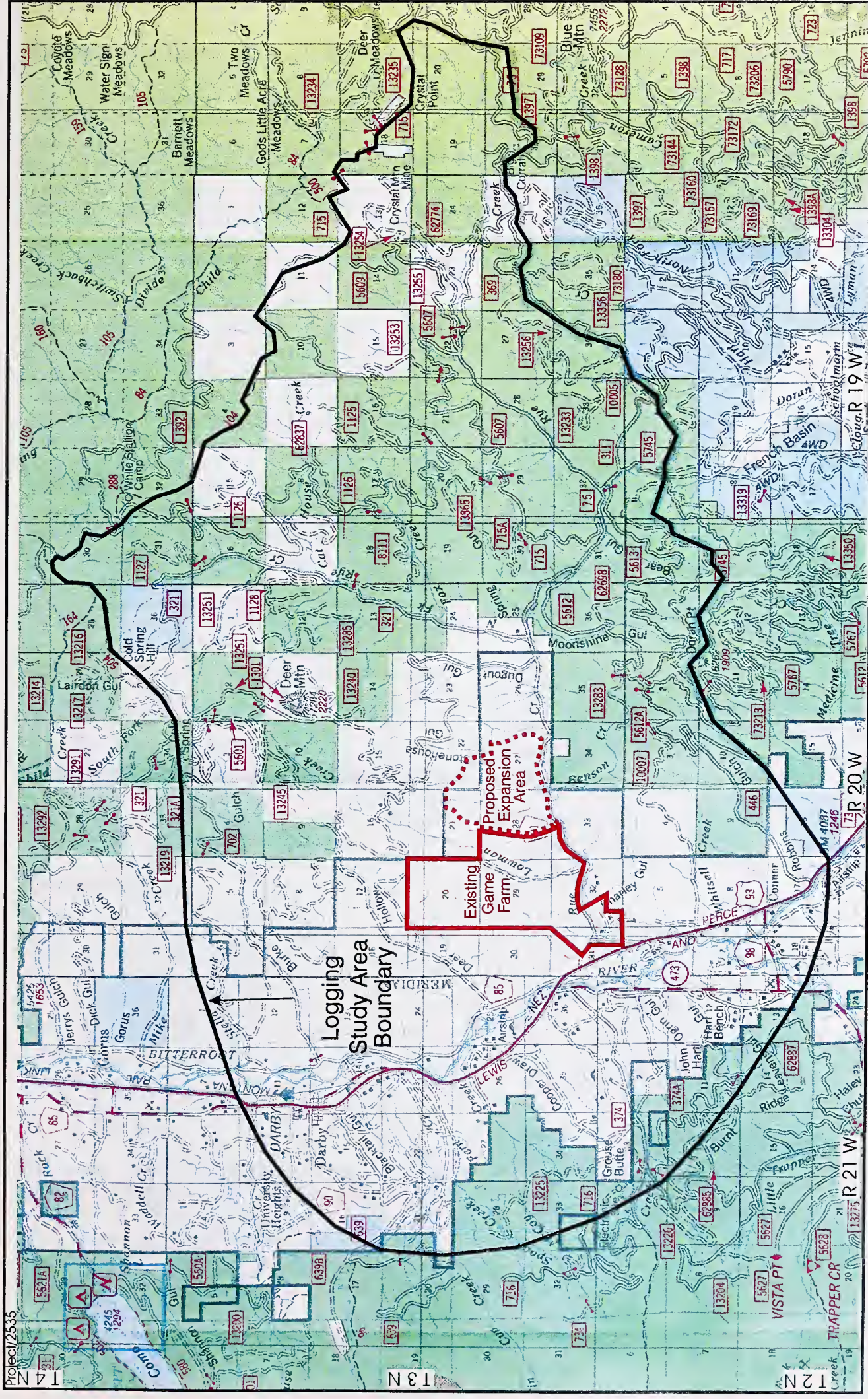
Moose

The study area does not represent good moose summer range due to its lack of high elevation wetland shrub plant communities. During the winter, moose utilize low elevation riparian habitat, aspen stands, and Douglas fir stands to browse on willows, dogwood, and other shrubs. They are adapted to cope with deep snow and are capable of wintering in areas with considerable snow cover.

Moose density and numbers in the Sapphire and Bitterroot Mountain Ranges are not known. A few moose are consistently observed on the Rye Creek winter range each year (FWP 1997e) and moose pellet groups were observed in the study area during field reconnaissance (FaunaWest 1997).

Mule and White-tailed Deer

Both mule and white-tailed deer occur within the study area. Mule deer use similar habitats as elk and also are seasonally migratory. However, there are notable differences between deer and elk. During winter, mule deer tend to winter at lower elevations than elk because they are a smaller animal with a lesser capacity to cope with deep snow. Consequently, access to the Rye



From USDA Forest Service Bitterroot National Forest

Study Area for Logging Impacts
Proposed Expansion EIS
Big Velvet Game Farm Ranch
Ravalli County, Montana
FIGURE 3-2



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Creek critical winter range is extremely important to mule deer. While the statewide mule deer population is decreasing, the Bitterroot Valley mule deer population south of Hamilton has remained stable for the past 5 years (FWP 1997c).

The Rye Creek winter range receives consistent and considerable use by mule deer. During the past 8 years, mule deer numbers on the Rye Creek winter range have averaged 563 animals (FWP 1997b). During the winter of 1996-97, a total of 860 mule deer were counted in the Rye Creek winter range (**Table 3-2**). Of these deer, 620 were observed on critical winter range within the proposed expansion area (FWP 1997c).

A few white-tailed deer utilize Rye Creek and generally inhabit riparian zone vegetation on a year-long basis. The portion of Rye Creek in the study area has extensive bottomlands but the riparian zone is restricted by agricultural activity. Better white-tailed deer habitat occurs along the Bitterroot River. Rye Creek does not provide the necessary combination of food and cover for wintering significant numbers of white-tailed deer.

Bighorn Sheep

Bighorn sheep occupy the southern Bitterroot Mountains but herd ranges do not include the study area. The failure of sheep to use this area can be attributed to lack of suitable sheep habitat.

Mountain Goat

Mountain goats are native to the Bitterroot and Sapphire Mountains. Goats prefer high elevation cliffs and talus slopes but will venture into whitebark pine and subalpine fir habitats. The lack of suitable cliff habitat within the analysis area precludes it as suitable mountain goat habitat.

Black Bear

The entire study area is suitable habitat for black bears. Black bears tend to den on steep north slopes at around 7,000 feet in elevation and hibernation occurs from November to April. Black bears frequently use south facing slopes on deer

and elk winter ranges upon emerging from hibernation. Black bears forage extensively on grasses and forbs during spring and early summer. They will also scavenge on winter-killed deer and elk on winter ranges in early spring and will also prey upon elk calves and deer fawns in late spring.

The black bear population in the Sapphire and Bitterroot Mountains is hunted during fall and spring, and sustains considerable hunting pressure in relation to its reproductive potential. There are no population estimates for this species in the study area. At least one black bear has entered the existing game farm and was captured and removed.

Mountain Lion

Mountain lions occur throughout the mountains on either side of the Bitterroot Valley and utilize a variety of habitats on a seasonal basis. Mountain lions primarily prey on deer and elk, and the seasonal distribution of these two species determine the seasonal distribution of mountain lions. Although there are no population estimates for lions in this area, population estimates in comparable habitat in other areas is about 5 to 7 adults per 100 square miles (FWP 1997e). The study area contains suitable habitat for mountain lions and at least one lion was present within the BVR game farm at the time of fence closure. This individual was captured and removed.

GAME BIRDS

Forest Grouse

Three grouse species occur in the Northern Rocky Mountains: blue grouse, spruce grouse and ruffed grouse. The study area contains suitable blue grouse habitat for spring and summer breeding and nesting habitat, but there are no population data specific to this area. The study area does not provide suitable habitat for spruce and ruffed grouse species.

FOREST CARNIVORES

Lynx

Historically, the lynx was a common predator in the Bitterroot and Sapphire Mountains. The lynx is still present within this region today but apparently at a much lower density. The study area is within its present range but generally does not offer suitable habitat characteristics for lynx because of its low elevation and lack of conifer cover.

Wolverine

The study area is situated within the historic distribution of wolverine but generally does not contain suitable habitat because of its low elevation and lack of conifer cover.

Fisher

The fisher is associated with mature and old growth coniferous forests. However, they utilize a variety of earlier successional stages and use forested riparian habitat as travel corridors. The study area does not contain suitable habitat for this species.

SENSITIVE FISH SPECIES

Fish Habitat

All drainages in the study area flow into Rye Creek except Deer Hollow which flows directly into the Bitterroot River. Rye Creek contains a diversion dam near Highway 93 that acts as a fish passage barrier from the Bitterroot River to Rye Creek during normal flows. A weir is located near Lowman Gulch that also serves as a passage barrier (Clancy 1997). Water temperature at a man-made impoundment on Lowman Creek was noted in August 1995 to increase from 52 to 59° F within the pond to exiting the pond (Clancy 1997).

The Bitterroot River is considered a high quality trout fishery (Clancy 1997). Five to six trout species are present in the Rye Creek - Bitterroot

River area: Westslope cutthroat, rainbow, brown, brook, bull, and possibly Yellowstone cutthroat trout.

Westslope Cutthroat Trout

Westslope cutthroat trout are indigenous to the Bitterroot River and its tributaries. Extant populations of westslope cutthroat trout tend to be small, isolated, and located in tributary drainages to the Bitterroot River. The introduction of rainbow trout, brown trout, and brook trout has heavily impacted native cutthroat trout populations. Within the Bitterroot River, Westslope cutthroat trout has hybridized with rainbow trout, and possibly Yellowstone cutthroat trout.

Rye and Lowman Creeks support brook trout, cutthroat trout and whitefish fisheries in their lower and middle reaches; these fish generally are less than 8 inches long. During a sampling effort in 1994 just above the BVR game farm, Rye Creek was rated as having good trout habitat (Clancy 1997). Sampling of these two drainages in 1994 and 1995 has shown that cutthroat trout present are most likely pure strain westslope cutthroats and have not been hybridized (Clancy 1997). However, earlier sampling in 1983-84 in which fish were only visually inspected, listed the cutthroat trout as cutthroat X rainbow trout hybrids.

THREATENED, ENDANGERED AND CANDIDATE SPECIES

WILDLIFE AND FISH SPECIES

In accordance with Section 7(c) of the Endangered Species Act, the USFWS has determined that three listed and one proposed T & E Wildlife Species may be present in the study area (USFWS 1997). The federally-listed species are the peregrine falcon, bald eagle and gray wolf; the bull trout is a candidate for Federal listing (Table 3-3). Although not listed by the

**TABLE 3-3
THREATENED, ENDANGERED AND CANDIDATE SPECIES
POTENTIALLY OCCURRING IN THE STUDY AREA
BVR GAME FARM EXPANSION**

Common Name	Status	Occurrence
Bald Eagle	Threatened	Nests and winters along the Bitterroot River.
Peregrine Falcon	Endangered	Nests in canyons in Bitterroot mountains.
Gray Wolf	Threatened	Non-essential experimental population; transient through area.
Grizzly Bear	Threatened	Transients possible, reintroduction is being considered.
Bull Trout	Candidate	Rare in the upper Bitterroot River and some tributary drainages.

USFWS in their determination, the grizzly bear could potentially move through this area as transient individuals and is also being proposed for reintroduction into the Selway-Bitterroot Wilderness.

Gray Wolf

The gray wolf has recently been reintroduced to central Idaho as an experimental non-essential population. The study area lies within the experimental non-essential zone designated for this recovery effort. Active wolf packs are located in the Ninemile drainage 90 miles northwest of the study area, in the Deer Lodge Valley 60 miles northeast of the study area, and the Frank Church River of No Return Wilderness 60 miles southwest of the study area. Although there are no confirmed wolf sightings in the general vicinity of the study area, existing wolf packs in the above areas are within close enough proximity that transient individuals could periodically pass through this general area (FaunaWest 1997).

Grizzly Bear

The study area lies within a region that is classified as *Management Situation 5* - areas where grizzly bears no longer occur or may occur only as transitory individuals (FaunaWest 1997). Survival or recovery values of these areas for grizzly bears are unknown, and it is unlikely that federal activities here will affect grizzly bear recovery.

Peregrine Falcon

The peregrine falcon may periodically utilize the study area. Known peregrine aeries exist at Painted Rocks Lake about 20 miles south of the study area, and west of Hamilton about 20 miles north of the study area. In addition a suspected aerie may exist near Lake Como on Rock Creek about 10 miles northwest of the study area (Ormiston 1987). Within the Bitterroot Valley, suitable peregrine habitat is primarily found in steep canyons with extensive cliff systems on the west side of the valley. The study area generally lacks suitable nesting habitat for peregrine falcons.

Bald Eagle

The closest known bald eagle nest to the study area is located at the Daly Pond 20 miles north of the study area. This nest has been used for the past 3 years but no young have been successfully produced (Ormiston 1997, Flath 1997). Bald eagles winter along the Bitterroot River and have been observed in the vicinity of Rye Creek (Ormiston 1997). An aerial survey of the Bitterroot River in the winter of 1995 resulted in observations of 16 adult and 15 immature bald eagles (FaunaWest 1997).

Bull Trout

Bull trout in Montana is found primarily west of

the Continental Divide and is native to the Bitterroot drainage system. During this century, its numbers have declined throughout its range. It is now a candidate species for federal listing as a threatened species. The bull trout is rare in the main stem Bitterroot River and present in some tributary drainages (Thomas 1992). Streams in pristine watersheds tend to have more robust populations than streams in watersheds with considerable road development, logging, agriculture and other activities. The bull trout occurs in Rye Creek but in extremely low numbers: sampling in Rye Creek during 1983, 1984, 1994, and 1995 resulted in the capture of only two bull trout (Clancy 1997).

VEGETATION SPECIES

No plants listed as endangered or threatened under the Endangered Species Act are known to occur within the study area. However, data collected by the Montana Natural Heritage Program (MNHP) show one sensitive plant species (Lemhi beardtongue), within 2 miles of the study area, and eight occurrences of this species within 4 miles of the study area. All occurrences are at similar elevation, aspect, and in the same vegetation community as that present on the expansion area. Most of the sites surveyed locally for threatened and endangered species are on public land (MNHP 1997).

LAND USE

The Big Velvet Ranch game farm and proposed expansion area is located in Ravalli County, Montana (T03N, R20W, Sections 20, 21, 22, 27, 28, 29, 31 and 32). Ravalli County is bordered on the north by Missoula County, on the east by Granite County, on the south by Deer Lodge County, and on the west by the state of Idaho.

PRIMARY LAND USE

Land use in the vicinity of the BVR game farm includes agriculture (game farming), residential,

logging and recreation. Game farming is the major land use in the study area with residential use as a secondary land use.

The land use study area is delineated in **Figure 3-1** and is primarily composed of private land and a small amount (approximately 600 acres) of land administered under the USFS. The entire BVR game farm and proposed expansion area is located on privately-owned land. Property adjacent to, and directly east and north of, the proposed expansion area is currently for sale as residential property subdivided into 10- to 20-acre parcels.

LOGGING ACTIVITIES

Timber harvesting is historically a major land use and important contributor to the local economy. Recently timber harvests have declined and are limited to private land harvest in the Darby region. Approximately 2.7 million board feet (MMBF) of Ponderosa pine and Douglas-fir have been harvested from 400 acres in the study area during the 5-year period of 1992 through 1996. Timber harvesting in the Rye Creek area during this 5-year period has been from private property owned by the Darby Lumber Company. The harvested portion of the study area is located at the northwest edge of the study area in T03N, R20W, Section 15 (DNRC 1997b), and to limited cuts on BVR property which are described under the "Vegetation" section in this chapter. Approximately 52 MMBF have been cut during the past 5 years in an area that includes the entire Rye Creek watershed and the Bitterroot floodplain between Darby and Conner, Montana (**Figure 3-2**).

ROADS

The BVR game farm is bisected by a county road (Rye Creek Road) that provides access from the Bitterroot Valley to the Sapphire Mountains via the Rye Creek drainage. The most recent road count on Rye Creek Road, conducted before the BVR game farm was licensed, determined that an average of 291 vehicles per day used the road during week days, and an average of 90 vehicles per day used the road on weekends (Ravalli County Road Department 1990). Road use during



View looking
south down
Jeep Trail Creek



View of
north portion of
Expansion Area

Existing Conditions
Proposed Expansion EIS
Big Velvet Game Farm Ranch
Ravalli County, Montana
FIGURE 3-3

that time is believed to be primarily by logging trucks (USFS 1997). Road use and road maintenance has not increased significantly since the licensing of the BVR game farm (Ravalli County Road Department 1997).

Rye Creek road is currently closed periodically for short periods of time by the BVR game farm to transfer game farm animals from the contained area north of Rye Creek to the quarantine and handling area south of Rye Creek. BVR is required to provide warning signs and flags on either side of the gates to warn traffic of the closure. This practice has not significantly affected traffic flow on Rye Creek Road (Ravalli County Road Department 1997).

All other roads in the study area are privately-owned. Roads in the proposed expansion area are primarily unimproved jeep trails and are located primarily on ridge tops with the exception of a road constructed adjacent to Jeep Trail Creek. Best management practices (BMPs) for erosion control have not been applied to roads in the proposed expansion area.

VISUAL RESOURCES

The landscape of the study area (existing game farm and proposed expansion area) is characterized by broad open vistas framed by high mountain ranges and steep hillsides. The study area is located on hilly terrain between the Sapphire Mountains and the Bitterroot Valley. The Bitterroot Mountains, including Trapper Peak can be viewed from the study area.

Vegetation in the study consists primarily of brush with grass understory. Natural vegetation patterns are disturbed in the existing game farm by overgrazing and road and fence construction. Dominant vegetation colors are straw yellow, yellowish green, and dark green.

Soil and rock are exposed where vegetation cover is disturbed by land use activities or where

bedrock outcrops are present. Soils range in color from light yellowish-brown to dark brown. Color hues of disturbed soils are stronger than those of undisturbed areas. These colors contrast moderately with surrounding soils and vegetation.

The existing game farm facilities are visible from the county road as fenced areas containing elk and deer. The fences are 8 to 9 feet high and constructed of mesh wire. Terrain on either side of the perimeter fence is cleared and graded. Game farm elk and deer can be viewed from Rye Creek Road. The proposed expansion area is fenced along its east and west sides (**Figure 2-1**). Wooden fence posts on the south side of the expansion area can be seen from Rye Creek Road. **Figure 3-3** shows a view from the north edge of the proposed expansion area, looking down the Jeep Trail Creek drainage and a view of the east portion of the expansion area showing soil exposed by a road cut.

CULTURAL RESOURCES

Cultural resources include archaeological, historical, and architectural sites and artifacts that allow a better understanding of the lifestyles of early societies. Although all cultural resources provide information collectively on the past, some sites contain information for research, public interpretation, and use by future generations. Cultural resources are locations of past human activity defined by clusters of features and artifacts. The cultural resources study area includes the existing game farm and proposed expansion area. Surveys in the BVR game farm area have recorded no historic sites (SHPO 1997).

PREHISTORIC ACTIVITIES

Prior to exploration and settlement of the Bitterroot Valley by European-Americans, Native Americans (primarily the Flathead Tribe) were attracted to the fertile valley because of its mild climate. The Flathead Indians occupied the area for hunting and gathering as early as the 1500s

and the Blackfeet and Shoshone Indians also occupied the valley at times from the 1700s. Roots of the pink-flowered, succulent Bitterroot plant, abundant in the area and Montana's state flower, were an essential part of the Indian diet (McRae and Jewell 1992). By the time Lewis and Clark came through the valley in 1805, the Flathead regarded the area as their central homeland (Tirrell 1991).

HISTORIC ACTIVITIES

Lewis and Clark passed down the Bitterroot Valley from south to north in 1805. While little mining has taken place in the Bitterroot Valley, the discovery of gold in nearby valleys and the establishment of mining boomtowns created a demand for foodstuffs. In 1872, the federal government began to transfer Flathead Indians from the Bitterroot Valley north to the Mission Valley in response to pressure from farmers moving into the area. By 1891, the last band of the Flathead people left the valley. In 1888, Marcus Daly began acquiring land in the Bitterroot Valley for timber and his personal use. He built a 28,000-acre estate on the outskirts of Hamilton that became his summer residence and race horse stock farm.

SOCIAL AND ECONOMIC RESOURCES

The socioeconomic study area includes Ravalli County (the county in which the proposed expansion area is located) and the town of Darby.

POPULATION TRENDS AND DEMOGRAPHIC CHARACTERISTICS

Ravalli County was the fastest growing county in Montana between 1990 and 1995, increasing in population by 28.9 percent from 25,010 in 1990 to an estimated 32,230 people in 1995 (Montana Department of Commerce, Census and Economic

Information Center 1996). Ten-acre ranchettes sprung up throughout the county in the 1970s. By 1990, an estimated 16 percent of Ravalli County workers commuted to Missoula County for employment. The area has attracted retirees, and many newcomers moving into the area have been considered "economically upscale out-of-staters" (Alwin 1983). The area also attracted a number of "survivalists, people who want to be in the safest place possible in case of nuclear war or other disasters, including civil insurrection" (Alwin 1983). The upward trend in population experienced by the county over the past several years is expected to continue, rising to an anticipated 45,000 by year 2005 (Bitterroot Valley Chamber of Commerce, no date).

Similar to the county population, Darby grew in population by 23.3 percent between 1990 and 1994. The 1990 population was 625, increasing to an estimated 771 persons by 1994 (Montana Department of Commerce, Census and Economic Information Center 1995). In 1990, the population was almost evenly divided between males (50.1 percent) and females (49.9 percent); 99.4 percent were Caucasian; and 10 percent were 5 years old and under, 23 percent were between 5 and 18 years old, 20 percent were between 19 and 34 years old, 19 percent were between 35 and 49 years old, 11 percent were between 50 and 64 years of age, and 17 percent were 65 and older (Montana Department of Commerce, Census and Economic Information Center 1991). Over the years, the community has had its economic ups and downs--surviving three fires which destroyed its main street, and the boom and bust cycles of mining, commercial apple producing, fur trading, and logging.

Many of the area residents have a strong concern about the fate of the area's land, natural resources, local businesses, and quality-of-life. During the BVR scoping period, some local residents (including neighbors of the BVR) expressed discontentment with the existing BVR operation and felt that the operation has negatively affected their quality-of-life. Others expressed the view that if a person owns a piece of property, they should be entitled to make a living off their land as long as they do not infringe on the rights of others.

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EMERGENCY SERVICES

The Montana Highway Patrol, Ravalli County Sheriff's Department, and Darby Police Department provide law enforcement services in the study area. In 1995, the Darby Police Department employed two full-time sworn officers, or 2.59 officers per 1,000 population (Montana Department of Justice, Board of Crime Control, Statistical Study Center 1996).

The Marcus Daly Memorial Hospital in Hamilton is the closest hospital to the proposed expansion area and the only hospital in Ravalli County. The hospital is a 48-bed acute facility with 24-hour emergency and ambulance services. Five medical clinics and 15 dentists also provide health-care services in the county and a full range of specialty medical services are offered in Missoula, approximately 65 miles north of Darby (Bitterroot Valley Chamber of Commerce no date).

LOCAL ECONOMY

Principal industries in the Bitterroot Valley are log home manufacturing, wood products, medical research, agriculture, and small manufacturers of products such as electronics, bow and arrows, backpacks, ski jackets, and windsocks (Bitterroot Valley Chamber of Commerce 1996). Small businesses, oftentimes open only during the tourist season, sell locally-made crafts, organic vegetables, and herbs, and outfitters provide guiding services to hunters and anglers. The top 10 private employers in Ravalli County in 1995 were, in alphabetical order: Alpine Log Homes, Darby Lumber, Discovery Care Centre, Interim Healthcare, K-Mart, Marcus Daly Memorial Hospital, Ribicell Immunochem Research, Selway Corporation, Super 1 Foods, and Valley View

Estates Nursing Home (Montana Department of Labor and Industry, Job Service Division, Research and Analysis 1996).

Although not a major employer, the BVR operation adds to the local economy through year-round and seasonal employment at the Ranch (12 full-time, 3 part-time workers), purchase of supplies and services from businesses within a 100-mile radius of the Ranch, payment of personal property taxes, and local purchases made by out-of-state shooters staying at the BVR lodge. The BVR operation generates more than \$1,000,000 of out-of-state money from the sale of breeding stock (55 percent), hunting of trophy game farm animals (40 percent), and production and sale of antlers in velvet (5 percent) (BVR 1997b).

The unemployment rate of Ravalli County has consistently been higher than the state unemployment rate since 1990, ranging from a high of 10.8 percent in 1991 to a low of 5.8 percent in 1994. In 1995, the county had an unemployment rate of 6.5 percent compared to the state average of 5.9 percent (Montana Department of Labor and Industry, Job Service Division, Research and Analysis 1997).

Per capita personal income for Ravalli County in 1994 was \$15,143, lower than the state average of \$17,794. Per capita personal income was highest in Yellowstone County (\$20,530) and lowest in Mineral County (\$11,707) in 1994 (U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System 1996).

CHAPTER 4

CONSEQUENCES OF THE PROPOSED ACTION AND ALTERNATIVES

INTRODUCTION

Chapter 4 describes potential direct and indirect impacts of the proposed expansion of the BVR game farm (Proposed Action) and Alternatives. This chapter also addresses irreversible and irretrievable commitments of resources, and cumulative effects of the Proposed Action. Alternative A (Proposed Action with mitigation measures) was developed to avoid potential impacts that could result from the Proposed Action. Impacts of Alternative A are identical to those of the Proposed Action with the exception of the positive effects of mitigation measures discussed under each resource section. The No Action Alternative would result in not permitting the proposed game farm expansion. An analysis of the impact of Alternative A to private property is also provided in this chapter of the EIS.

Irreversible commitments of resources cannot be reversed except over an extremely long period. Irretrievable commitment refers to resources that are lost for an indefinite time. Cumulative effects result from the incremental impacts of an action when added to other past, present, or reasonably foreseeable actions. Implementation of the Proposed Action or the Proposed Action with mitigation measures would cause resources to be consumed, committed, or lost during the life of the BVR game farm.

Summaries are provided at the beginning of some resource sections that have a relatively large amount of information presented on the impact analysis. Irreversible and irretrievable commitment of resources is discussed only for those resources that have associated impacts. Cumulative effects are discussed at the end of this chapter.

GEOLOGY AND PALEONTOLOGY

DIRECT AND INDIRECT IMPACTS

Proposed Action

Confined elk and deer use in the expansion area would not adversely impact geological and/or geomorphological conditions at the proposed expansion site. No paleontological resources or unique geological/physical resources are known to occur within the expansion area.

Alternative A: Proposed Action with Mitigation Measures

Mitigation measures associated with Alternative A would have no effect on geology and paleontology at the proposed BVR expansion site.

No Action Alternative

The No Action Alternative would result in no impacts to geological or paleontological resources.

WATER RESOURCES

SUMMARY

Impacts to surface water from the proposed BVR expansion would be associated primarily with increased erosion of the land surface and associated sedimentation increases to drainages in the project area. Increased animal use in the area would cause a reduction of vegetative cover and greater disturbance of soil, leading to erosion and topsoil loss from forces of wind and water. Most road work has been completed in the expansion area; however, road widening and

maintenance activities would contribute to increased sedimentation. Loss of some riparian vegetation along ephemeral drainages in the expansion area would reduce the capacity of plants to filter sediment and nutrients from surface water.

Surface water and/or groundwater quality could be impacted by game farm animal feces if game animals are allowed free access to drainages. No adverse impacts to surface water and groundwater rights are expected from the Proposed Action.

DIRECT AND INDIRECT IMPACTS

Proposed Action

Increased elk traffic and browsing in the expansion area would disturb the existing soil structure and reduce vegetative cover. Land slopes in the proposed expansion area generally are steep, ranging from 15 to 70 percent. Soil in the proposed expansion area has moderate erosion properties (see "Soil Resources" section). Bare ground areas would increase, resulting in greater surface water runoff and reduced water infiltration to the soil. Elimination of some vegetation also would reduce the soil binding effect of plant root mass.

Because of the ephemeral nature of surface water flow in the proposed expansion area, increased sedimentation to Jeep Trail Creek and the other minor drainages would occur primarily during periods of snowmelt and heavy rainfall events when sediment levels in streams typically are already elevated. The amount of surface runoff that occurs in the expansion area would increase because of the reduced vegetative cover and increased percentage of bare ground. This runoff would contain a higher quantity or load of sediment compared to baseline conditions. The increased runoff would also cause a higher sediment load to enter Rye Creek from the proposed expansion area, primarily from the Jeep Trail Creek drainage.

Road construction activities in the proposed BVR expansion area would also contribute to increased sedimentation in streams. Most road construction for the expansion area has been completed; however, road improvements would occur. Existing roads in the proposed expansion area have undergone erosion from runoff. In addition, some of these roads are located close to the drainage channels (e.g., road along Jeep Trail Creek); therefore, widening and/or maintenance of these roads has a high potential for erosion and increased sedimentation in drainages unless adequate erosion control measures are implemented.

Increased concentrations of sediment in Rye Creek and the Bitterroot River from elk activity should be relatively minor because Jeep Trail Creek and other unnamed drainages in the proposed expansion area are relatively small and ephemeral. The additional sediment load from the expansion area, however, would deposit more sediment in these streams and potentially impact aquatic habitat and fish spawning areas (see "Wildlife and Fisheries" section).

Increased erosion, sedimentation, and vegetative destruction could occur to some areas outside of the BVR game farm and proposed expansion area as a result of displaced wild game. If the displaced wild game concentrate in selected areas, these impacts could become evident.

Surface water and/or groundwater quality could be impacted by game farm animal feces if proper runoff controls or site sanitation methods are not utilized. This could result in increased nutrient levels and pathogens getting into the water. The most likely areas for possible contamination are near drainage channels and where groundwater is shallow (i.e., alluvium in valley bottoms). The portions of the BVR most susceptible to these problems are the holding pen areas located near Rye Creek, which are not proposed for change by the expansion. Minor increases in nutrient levels in surface water and groundwater from the proposed expansion area may occur because of the increased presence of animals.

No adverse impacts to surface water and groundwater rights area expected from the Proposed Action. One or two water supply wells for the game farm animals are proposed to be completed in the southwest portion of the proposed expansion area. These wells probably will be completed in shallow alluvium and/or bedrock. Withdrawal of water from these wells for the game farm animals should be at rates that would not adversely effect existing water users. No wells, springs, or irrigation and stock water carrier ditches are located proximal to the proposed water supply wells or within the expansion area. The BVR must obtain water rights from the DNRC in order to utilize water from any unpermitted source.

Alternative A: Proposed Action with Mitigation Measures

Alternative A would result in reduced erosion and sedimentation problems in the proposed expansion area because of: (1) fenced riparian areas and (2) BMPs for road building and maintenance. These activities likely would result in erosion and sedimentation levels that are similar to existing conditions in the expansion area. If BMPs are applied to existing roads in the expansion area, erosion and sedimentation conditions would improve because such BMPs have generally not been applied to the existing roads.

No Action Alternative

The No Action Alternative would result in no additional impacts to water resources beyond those that are associated with the existing BVR game farm operation. Impacts associated with the existing game farm are similar to those described above for the Proposed Action.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

During the life of the BVR expansion area operation, groundwater from the proposed water supply wells would result in an irretrievable commitment of that resource. Once use of the

wells is terminated, the groundwater system is expected to recover promptly to conditions that existed prior to operation of the BVR game farm.

SOIL RESOURCES

DIRECT AND INDIRECT IMPACTS

Proposed Action

Direct impacts to soil resources resulting from the Proposed Action are reduced surface soil structure and thickness of the organic horizon. Direct impacts are a result of more concentrated use of the proposed expansion area by elk than under current conditions and are a reflection of NRCS capability classification (severe risk of damage) if used for pasture. Impacts are primarily the result of steep slopes and sandy soil texture present in the proposed expansion area. Direct impacts associated with road building and/or maintenance on the soil resource include increased erosion along road cuts and fills due to loss of vegetation.

Indirect impacts include lower infiltration rates and a subsequent increase in surface runoff as a result of the disturbance of surface soil structure. Removal of topsoil by soil erosion may increase due to the combination of direct impacts and higher surface runoff. Increased soil erosion may result in soil erosion features developing on the landscape such as rills and gullies, and less soil available to support plant growth. Wind erodibility may also be increased, especially with the loss of vegetation and exposure of bare ground.

Alternative A: Proposed Action With Mitigation Measures

Direct and indirect impacts to soil resources would be reduced under this alternative if road construction and placement were limited and BMPs were implemented. Fencing of riparian

areas also would reduce soil loss in the expansion area.

No Action Alternative

The No Action Alternative would not affect the existing condition of soil resources in the proposed expansion area unless the stocking rate is increased due to addition of domestic animals or higher natural use by wildlife.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Increased soil erosion resulting from the Proposed Action would cause an irretrievable loss of soil. If greater than the calculated maximum average annual soil loss (NRCS 1997) for the respective soil association, soil productivity would be adversely affected unless the soil functions were reclaimed through the use of soil amendments such as manure, compost and fertilizer.

AIR RESOURCES

DIRECT AND INDIRECT IMPACTS

Proposed Action

No significant impact to air resources is expected to occur as a result of the Proposed Action. Particulate emissions (dust) from road maintenance and building activities in the proposed expansion area would be caused by excavating and dirt moving. In addition to particulates from construction, ambient particulates from wind erosion, traffic on unpaved roads and other sources of exposed soil would occur as the result of increased disturbance in the expansion area. Ambient air standards would not be expected to be exceeded. Levels of particulate emissions from the Proposed Action

are expected to be similar to those for currently authorized activities at the BVR game farm.

Alternative A - Proposed Action With Mitigation Measures

Impacts on air resources resulting from the Proposed Action with mitigation measures would be the same as those discussed under the Proposed Action. Ambient air standards probably would not be expected to be exceeded.

No Action Alternative

Impacts from the No Action Alternative would be the same as those discussed under the Proposed Action. Particulate emissions may increase for a short period of time if the property is developed for residential use.

VEGETATION, WETLANDS AND RIPARIAN AREAS

SUMMARY

Enclosing 300 game farm animals throughout the year on land that is presently utilized for approximately one-half the year as winter range probably would result in vegetation conditions similar to the existing BVR game farm area. Vegetation would be over-utilized resulting in decreased plant vigor, and eventual mortality. Increased soil erosion and weed populations would result from declining native plant populations. Soil compaction and over-utilization of riparian vegetation in riparian and wetland zones would reduce the capacity of the riparian zones to filter sediment from upland sites.

DIRECT AND INDIRECT IMPACTS

Proposed Action

There are approximately 275 animal unit months (AUMs) of forage in the expansion area based on NRCS data for a shallow range site in fair condition (USDA SCS 1959). The expansion area is in fair to poor condition at the present time (Durran 1997). One AUM is the amount one domestic cow with calf would consume in one month. Approximately 1.5 elk consume 1 AUM (FaunaWest 1997; Basting 1997). Based on a proposed stocking rate of 300 elk, there are approximately 1.38 months of forage for elk in the expansion area. Although elk would be fed throughout the year, they would select live palatable plants over hay. Elk would continue to browse throughout the year due to higher palatability of native vegetation, and to obtain nutrients not available in supplemental feed.

Direct impacts to vegetation from the Proposed Action include:

1. Overutilization of vegetation within the proposed expansion area resulting in reduced plant vigor, productivity and cover;
2. Probable reduction or elimination of some native grass, forb and shrub species, and decreased species diversity over time;
3. Increased utilization of elk and deer winter range located outside the proposed expansion area which would concentrate the same number of animals on fewer acres;
4. Exacerbation of present overutilization and potentially reducing existing vegetation cover, density and diversity.

Riparian vegetation that occurs along stream channels in the expansion area (primarily along

Jeep Trail Creek, **Figure 3-1**) may be adversely affected from increased elk activity. Loss of riparian vegetation along ephemeral drainages in the expansion area would reduce the capacity of plants to filter sediment and nutrients from surface water and accelerate stream bank erosion. Off-stream water sources (i.e., water supply wells) proposed in the southwest portion of the expansion area would reduce impacts to riparian areas such as increased turbidity and sediment load in streams.

Direct impacts of the Proposed Action on weed populations include a probable increase in abundance, density and diversity of weedy species due to further reductions in native plant populations. An increase in spotted knapweed would occur, as well as probable spread of leafy spurge and sulphur cinquefoil to the expansion area if they are not already present. Invasion by blue thistle is likely because of the presence of existing populations along Highway 93 and in the Rye Creek drainage upstream of the study area, and the suitability of habitat within the proposed expansion area.

Indirect impacts resulting from a decrease in plant density and cover of native vegetation include increased soil erosion due to loss of vegetative cover, and due to loss of the soil binding effect of the root mass from perennial grass, forb and shrub species. Soil erosion eventually would result in the inability of some plant species to become established, resulting in increasing bare ground. Slope stability may also be reduced due to loss of shrub root mass subsequent to death of existing shrubs. Knapweed dominated sites are more susceptible to erosion than similar bunchgrass dominated sites (FWP 1992).

Alternative A - Proposed Action with Mitigation Measures

Direct and indirect impacts to vegetation resources from the Proposed Action with mitigation measures would be the same as described for the Proposed Action with a reduction in the overutilization of riparian vegetation in the expansion area due to installation of fences along riparian zones.

No Action Alternative

The No Action Alternative would produce no additional impacts to vegetation.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

During the life of the BVR expansion area, difficulty in reestablishing vegetation along streams and heavily eroded areas would be an irretrievable commitment of resources.

WILDLIFE AND FISHERIES

SUMMARY

Consequences of the Proposed Action and project alternatives are presented in the context of how they affect habitat availability, animal behavior, and population impacts. Impacts to wildlife would include increased risk of disease transmission and hybridization from game farm animals, loss of critical winter range in the Rye Creek watershed, and a reduction in the numbers of wild mule deer in the area. Impacts to wildlife and fish species are summarized in **Table 4-1**. The term "winter range" used throughout this section of the EIS refers to critical elk and mule deer winter range as described in Chapter 3 under "Wildlife and Fisheries" unless otherwise specified.

DIRECT AND INDIRECT IMPACTS

Proposed Action

The most significant impact to wildlife from the Proposed Action would be the removal of an additional 920 acres (54 percent) from the remaining 1,690 acres of Rye Creek winter range. This would result in an expected loss to the Rye Creek herd of 400 to 600 mule deer over an extended period of time. Additional impacts of

the Proposed Action would include increased mortality to elk during severe winters, increased risk of disease transmission to wild game, increased risk of hybridization in wild game, increased use of agricultural lands by wild game, and increased risk of mortality to large carnivores.

Elk

Expansion of the game farm would adversely impact individual elk and would be expected to force the wild Rye Creek elk herd to other winter ranges. If winter range is available in other drainages, the long-term population viability of wild elk in the region would not be jeopardized during mild and normal winters. An increase in winter mortality is likely to occur, especially during severe winters, as a result of the Proposed Action.

Wild elk would not be expected to spend the winter and early spring on the Rye Creek winter range in comparable numbers recorded in recent years. With 54 percent of the remaining Rye Creek winter range fenced to exclude wild elk and enclosure fencing blocking easy daily movement across the remaining winter range, there would be a measurable decline in wild elk using the Rye Creek winter range. This response may not be immediate but may take several years for the Rye Creek elk herd to adjust its herd range to other areas. Although elk are a strong and adaptable species, this scenario assumes that there are other winter ranges in the area not fully occupied by elk.

Expansion of the game farm would impair migration of displaced elk to alternative winter range. If wild elk move to winter range at the west side of the BVR game farm, they would be forced to cross several high ridges and valleys. This would effectively double the effort required to cross the winter range over the fenced game farm. Other winter ranges that may support displaced Rye Creek elk are located in Charley Gulch and Benson Creek drainages (**Figure 3-1**). During periods of heavy snow cover and cold temperatures, this would place extra energy demands on elk trying to meet their daily nutritional requirements. Elk are faced with the

dilemma of remaining on one side of the enclosure and facing increased intraspecific competition or moving to reduce intraspecific competition and facing increased energy expenditures. During extremely severe winters, some winter mortality may occur that is directly attributable to the existing enclosures and the proposed expansion area enclosure. Another response by wild elk might be to compensate for lost winter range by increasing their use of agricultural lands (Knowles 1997).

Mule Deer

The Proposed Action would have the same impacts on wild mule deer as those described for the wild elk population; however, the extent of impacts would be substantially greater resulting in the probable elimination of most of the existing Rye Creek herd. Mule deer are less capable than elk during winter to disperse to marginal areas or to migrate across the high ridges and valleys to other winter range (FaunaWest 1997). That is, in part, because mule deer are likely to encounter snow depths at higher elevations that exceed their physical capabilities to travel through. The Proposed Action would impede migration routes to alternative winter range areas. Based on a January 1997 aerial survey (FWP 1997c), it is apparent that deer passage to the western portion of the Rye Creek winter range has already been impeded and this disparity would be expected to increase upon completion of the expansion area.

While alternative elk winter range is available in the Charley Gulch and Benson Creek drainages, there is no available deer winter range that is not already saturated with an existing herd (FWP 1997c). In addition, coyotes and mountain lions, under the appropriate conditions, can be effective predators on mule deer. The proposed game-proof fencing would be expected to increase the opportunity for coyote predation on wild mule deer during winter. In order for mule deer to escape coyote and mountain lion predation, adequate flight distances need to be available. Game-proof fencing tend to block or reduce mule deer escape routes below a critical value.

**TABLE 4-1
SUMMARY OF IMPACTS OF THE PROPOSED ACTION ON
SELECTED WILDLIFE SPECIES**

Species	Direct and Indirect Impacts	Cumulative Effects
Bald eagle	minor	minor, reduction of carrion and an increase in water turbidity
Peregrine falcon	none	none
Gray wolf	none	increased chance for transient individual to enter game farm enclosure
Grizzly bear	none	none
Elk	loss of 54% of critical Rye Creek winter range; game farm enclosure impedes daily movement and migration.	loss of 75% of Rye Creek winter range/game farm enclosures further restrict daily movement which impacts individuals and entire population
Mule deer	loss of 54% of critical winter range; game farm enclosure impedes daily movement and migration to other winter ranges. Expected long term herd reduction by 650 deer to winter kill or a special hunt.	loss of 75% of Rye Creek winter range/game farm enclosures further restrict daily movement and migration routes which impacts individuals and entire population. Expected long term herd reduction of 650 deer to winter kill or special hunts.
Black bear	risk of entrapment upon closure of expansion pasture	increased chance for bear to be lured into enclosure/impacts individual but not entire population
Mountain lion	risk of entrapment upon closure of expansion pasture	increased chance for lion to be lured into enclosure/impacts individual but not entire population
Blue grouse	loss of nesting and brood rearing habitat on 1,000 acres	loss of nesting and brood rearing habitat on 2,500 acres
Cutthroat trout	slight decline in water quality on lower Rye Creek	ground clearing, timber harvesting and elk grazing increases sedimentation in lower Rye Creek/ impacts individual fish but not population
Bull trout	slight decline in water quality on lower Rye Creek	ground clearing, timber harvesting and elk grazing increases sedimentation in lower Rye Creek/potential to impact this isolated population

Winter range in the study area can support a mule deer population density of approximately 0.17 mule deer per acre (6 acres per mule deer) for extended periods of time (greater than 5 years). The Proposed Action would reduce available Rye Creek winter range on the east side of the existing game farm to 600 acres which would be adequate to support a wild deer herd of approximately 100 over several winters of variable severity, based on the capacity of winter range in the study area to support mule deer populations. Currently there are approximately 755 wild mule deer utilizing the Rye Creek winter range east of the existing game farm. The Proposed Action

would result in a long-term loss of 400 (given a series of mild winters) to 650 (severe winters) mule deer probably through the result of poor recruitment of the fawn age class. The length of time for the decline in mule deer numbers to occur would depend on the frequency of severe and mild winters. Implementation of the Proposed Action may cause FWP to issue post-season permits for Rye Creek mule deer which would increase the number of hunting permits by 400 to 600 head for a one-time special hunt. This impact would only result in herd reduction if hunters are allowed access to land containing the high density of wild mule deer. Elk would be

expected to find alternative winter range and are not likely to suffer significant herd loss from the cumulative effects of activities in the study area.

Large Carnivores - Mountain Lion and Black Bear

With closure of the expansion area fence, there would be opportunity for mountain lions and black bears to become entrapped at the time of closure. Animals would have to be trapped and removed and there is risk that these animals might be fatally injured. There would also be a low risk of additional entrapment of lions and bears that are attracted to the site by the larger number of domestic elk following completion of the game farm expansion and by an increased number of dead game farm animals. These impacts could affect a few individual animals but population viability of mountain lions and black bears in the Rye Creek area would be sustained over the long-term.

Blue Grouse

The Proposed Action would decrease available nesting areas for the Blue Grouse. Individual grouse could be affected, but long-term population persistence of this species would remain in the Rye Creek drainage.

Cutthroat Trout

The Proposed Action would result in the introduction of additional sediment to surface water (see "Water Resources" Section 4). Increased sediment into lower Rye Creek during spring snow melt and major precipitation events would reduce the spawning success of cutthroat trout. However, the majority of the pure strain cutthroat trout are located above the stream segment where siltation would be significant. Wild trout in lower Rye Creek and the Bitterroot River immediately below Rye Creek could also be affected by increased sediment due the Proposed Action.

Disease Transmission To Wildlife

The Proposed Action would increase the total BVR game farm elk herd by 38 percent; an unknown portion of that additional herd would be imported. The fenced perimeter of the BVR game farm would be increased by 40 percent with the proposed expansion, increasing the exposure of game farm animals to wildlife. The Proposed Action does not include an electrified fence construction surrounding the perimeter of the expansion area but would include a smaller fence mesh size that would reduce contact between game farm animals and wildlife.

Transmission of disease from game farm animals to wildlife requires the importation of animals with harmful diseases that infect other game farm animals, and one or more of the following events; all of which could occur as the result of the Proposed Action:

- wild game and non game animals enter the facility (ingress), expose themselves to a disease and subsequently escape or are released back into the wild population;
- escape (egress) of infected domestic animals which carry the disease to wild populations;
- ingress of nongame species, such as coyotes, carrying infected material, such as parts from a carcass, out of the game farm; and/or
- nose-to-nose contact between game farm animals and wild game without ingress or egress occurrences.

The Proposed Action would increase the potential for harmful diseases to be transmitted from domestic animals to wildlife. The risk of transferring infectious diseases from game farm animals placed in the proposed expansion area to wildlife would increase due to an increase in: (1) number of game farm animals imported to the game farm (increased risk of importing disease); (2) number of game farm animals transported from one location to another (increases opportunities for contact with wildlife); (3) areal extent of game farm animal containment (reduced

ability to adequately monitor for containment failure and increased area of exposure to wildlife); and (4) containment structures that allow ingress and egress events. A technical report describing game farm diseases and hybridization and the potential for their transmission to wildlife in more detail is on file at FWP offices in Missoula and Helena (Wildlife Veterinary Resources 1997).

Disease transmission to wildlife has occurred at other game farms in Montana and in other states (FWP 1993). Since 1989, tuberculosis has been detected in captive deer herds in eight states in the U.S. and in three Canadian provinces (Essey and Kolter 1994) and has been found in six Montana game farms. In December 1993, a case of bovine tuberculosis (TB) was diagnosed in wild mule deer collected near a TB-infected game farm in Montana. Occurrence of TB in mule deer on property adjacent to a TB-infected ranch provides evidence for spread of this disease from captive deer to wild animals.

Montana regulations and required tests significantly minimize the potential for introducing and establishing harmful diseases; however, tests can be unreliable and some harmful diseases are not routinely tested. The following diseases pose greatest risks to wildlife in the vicinity of the BVR proposed expansion area:

- Bovine Tuberculosis
- Brucellosis
- Johne's Disease
- Meningeal Worm
- Cryptosporidiosis
- Chronic Wasting Disease

Genetic Hybridization of Wild Game

The Proposed Action would increase the potential for elk-red deer hybrids to mix with wild elk and introduce genetic hybridization into local or regional elk herds because of the same factors influencing the risk of ingress and egress events previously described under "Disease Transmission to Wildlife" in this section. For small and isolated elk populations, even a small escape of red deer hybrids would result in significant amounts of genetic hybridization with native elk (Lanka and

Guenzel 1991, Hobbs 1990). Genetic laboratories in the U.S. and Canada report that between 10 to 18 percent of all elk blood samples examined were positive for red deer hybridization (FWP 1993). The presence of red deer hybrids in North American elk breeding stock increases the risk that elk that are purchased by the BVR game farm for the proposed expansion area would also have red deer genes. Genetic testing is reliable only for first generation elk and less reliable with each succeeding generation (Wildlife Veterinary Resources 1997). Therefore, hybrids could be imported without detection.

Alternative A - Proposed Action With Mitigation Measures

Impacts of Alternative A are identical to those of the Proposed Action with the exception of the positive effects of mitigation measures discussed under each resource section.

Implementation of Erosion Control BMPs

Implementing BMPs for roads and road maintenance would reduce sedimentation in surface water and, thereby, reduce the impact to fish species.

Double Fence Containment

Installing a double fence around portions, or all of the outside perimeter, 10 to 12-feet apart with minimum heights of 10 feet for one fence and 9 feet for the other fence would reduce or prevent an unacceptable threat of introduction or transmission of serious diseases or parasites to native wildlife populations. It would also reduce or prevent an unacceptable threat of escape of captive game farm animals and establishment of feral populations that would result in habitat damage, habitat competition, or interbreeding with native wildlife populations. This mitigation measure would reduce or eliminate the frequency of ingress/egress events for domestic and wild big game and nose-to-nose contact between wild game and game farm animals. Double fencing would also reduce the occurrence of human activities (vehicle accidents, gates left open) and

environmental events (erosion, snow loading, some fallen trees and fence deterioration) that would otherwise breach a single fence. The likelihood of interaction (sparring) between domestic and wild animals would be reduced with the installation of a double fence of adequate height.

Double fences in excess of 10-feet (6-feet higher than 1997 snow depth [Haigh and Hudson 1993]), would reduce the ability for animals to jump over fences or cross after snow buildup. Because the current electrification system does not prevent nose-to-nose contact, electric fencing would be unnecessary if double fences were constructed.

Ingress/Egress Response Plan

Developing and implementing a FWP-approved response plan to address ingress/egress incidents would reduce the impact to wildlife by increasing the ability of BVR to monitor and control game farm animals and containment failure incidents.

Transportation of Game Farm Animals Across Rye Creek Road by Vehicle

This mitigation measure would reduce the risk of egressing game farm animals, thereby reducing the risk of disease transmission to, and hybridization with, wild game.

Exclude Deer From the Expansion Area

This measure would allow for more rapid detection of ingress and egress animals by eliminating deer entirely from the expansion area. Untagged and unmarked deer are currently present in the existing game farm due to the

difficulty in retrieving deer for handling purposes (DoL 1997). This measure would insure that any untagged and unmarked deer would be easily identified as ingress animals, thereby increasing the ability of the game farm operator to respond immediately to a deer ingress/egress and reduce the risk of disease transmission to the wild game population.

No Action Alternative

Currently, the existing BVR game farm excludes 1,400 acres (45 percent) of Rye Creek winter range. The remaining winter range, including the proposed expansion is approximately 1,690 acres and is utilized by 860 wild mule deer at an average density of 0.5 mule deer per acre (2 acres per mule deer). Winter ranges in the study area historically support mule deer densities of 0.17 or less (6 acres per mule deer) for extended periods of time. The remaining Rye Creek winter range is currently over-grazed and is expected to have progressively less regenerated vegetation each year (FWP 1997c). The No Action Alternative would result in a long-term reduction of 300 to 500 mule deer in the remaining Rye Creek winter range depending on winter severity.

The No Action Alternative would have no significant changes or additional impacts to habitat and related fish and wildlife within the study area.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

During the life of the BVR expansion area, loss of big game numbers would be an irretrievable commitment of that resource.

THREATENED, ENDANGERED AND CANDIDATE SPECIES

DIRECT AND INDIRECT IMPACTS

Proposed Action

Bald Eagles

Expansion of the game farm would not affect the long-term population persistence of bald eagles in this area.

Peregrine Falcon

The peregrine falcon would continue to occupy aeries at Painted Rock Lake, west of Hamilton, and the possible site at Rock Creek. The proposed expansion area is sufficiently remote from these aeries that the long-term persistence of peregrine falcons in this area would not be adversely affected.

Gray Wolf

The proposed expansion would not influence the long-term population persistence of wolves in Montana or Idaho. However chances of an individual transient wolf needing to be relocated to prevent depredation on domestic elk could increase slightly.

The number of wolves passing through the study area is expected to increase as a result of the Proposed Action. Wolves dispersing from wilderness areas would be attracted to the game farm with the 300 additional elk in the 1,100-acre expansion area. Following the expansion, wild mule deer and elk would be concentrated on smaller winter range area during winter, resulting in a more favorable prey situation for a transient wolf. With completion of game-proof fencing in

the expansion area, wild elk and deer would be more vulnerable to canid predation.

Grizzly Bear

The probability of transient grizzly bears in this area is extremely low. Expansion of the game farm would not likely influence long-term grizzly bear population persistence in the Northern Rocky Mountains.

Bull Trout

Increased turbidity in streams (see "Water Resources" section) would result in decreased spawning success of fish. The long-term population persistence of bull trout in Rye Creek under existing conditions is at risk; only two bull trout have been identified by FWP during four sampling events between 1983 and 1995. Details of bull trout reproductive ecology in Rye Creek are unknown, and it may be possible that they are spawning upstream from where sediments would be introduced into Rye Creek from the expansion area.

Vegetation

Threatened, endangered, or special status vegetation species have not been found within the study area.

Alternative A - Proposed Action With Mitigation Measures

Implementing BMPs for roads and fencing riparian areas would reduce sedimentation in surface water and thereby reduce potential impacts to bull trout.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

During the life of the BVR expansion area, a reduction in fish species would be an irretrievable commitment of that resource.

LAND USE

DIRECT AND INDIRECT IMPACTS

Proposed Action

The proposed expansion area would fence an additional 1,100 acres of private land beyond that currently approved by FWP. Land ownership in the study area would remain the same. Land previously used as open range by wild deer and elk for the winter would be used to contain domestic deer and elk throughout the year. The existing power line would be used.

A portion of the county road (Rye Creek Road) is currently used periodically to transfer game farm animals from the contained area north of Rye Creek to the quarantine and handling area south of Rye Creek as described in Chapter 2 under the Proposed Action (Figure 2-1). The Proposed Action would increase the frequency and/or duration of the closure of Rye Creek Road due to a proposed increase of game farm elk by 38 percent.

Alternative A - Proposed Action With Mitigation Measures

Transportation of game farm animals from the contained area north of Rye Creek to the quarantine and handling area south of Rye Creek by vehicles instead of through a gate across Rye Creek Road would decrease the frequency and/or duration of the closure of Rye Creek Road at the gate, thereby improving road safety conditions.

Implementing road-related BMPs would reduce erosional impacts to surface water.

No Action Alternative

Under this alternative, there would be no further game farm impacts on land use in the study area.

VISUAL RESOURCES

DIRECT AND INDIRECT IMPACTS

Proposed Action

Changes in the landscape from the Proposed Action are compared with the adjacent landscape to determine the degree of contrast in form, line, color, and texture. The primary impact of the Proposed Action would be the presence of a 9-foot fence on all sides of the expansion area. When viewing Jeep Trail Creek drainage in the expansion area (Figure 3-3), the Proposed Action would create weak contrasts with the existing landscape to the north and east due to loss of vegetative cover (see "Vegetation" section).

Alternative A: Proposed Action with Mitigation Measures

Placing a double fence around the perimeter of the proposed expansion area would result in an increase in the visual impact. Overall visual contrast would remain weak.

No Action Alternative

Under this alternative, no visual impacts would occur beyond those already present or associated with licensed activities.

SOCIAL AND ECONOMIC RESOURCES

SUMMARY

Positive impacts under the Proposed Action and Alternative A would include a slight increase in employment at the BVR operation. If the number

of game farm animals increased at the BVR due to the expansion, an increase in local spending (within a 100-mile radius of the BVR) for the purchase of goods and services could be realized and personal property tax revenues would increase.

Potential negative impacts under the Proposed Action and Alternative A would include: adverse effect on the quality-of-life of some residents; decrease in big game hunting and associated dollars spent in the local economy if wild animals using the winter range on the proposed expansion area were displaced (this decrease may be offset by dollars spent in the local economy by private shooters); and increased workload of DoL and FWP personnel who inspect, monitor, and respond to complaints concerning operation of the BVR game farm or egress/ingress problems. In addition, the potential of approving the expansion may also have fractionalized some segments of the community based upon support or opposition to the expansion.

Under the No Action Alternative, those who oppose the expansion would experience a sense of relief and a perceived preservation of their quality-of-life. Conversely, those who favor the expansion would be disappointed, especially local merchants and BVR employees who could reap additional revenue as a result of increased operations at the BVR.

DIRECT AND INDIRECT IMPACTS

Proposed Action

Under the Proposed Action, employment of 12 full-time and three part-time workers at the BVR would continue and two additional employees would be hired for the expansion operation (BVR 1997b). Businesses providing goods and services to the BVR would benefit the most as a result of increased local spending from operation of the expansion area. No impacts to the infrastructure of Darby would occur under the Proposed Action.

Some residents, including neighbors of the BVR and representatives of various local

wildlife/environmental groups, felt that, if the expansion were approved, the quality-of-life of area residents would be decreased by operation of the expansion area and consequent loss of wildlife winter range. Individuals also have commented that they were offended by the shooting of trophy game farm animals on BVR; feared the spread of disease from game farm animals to wildlife and human populations; did not approve of FWP license fees being used for monitoring game farms and enforcing game farm laws; and were unhappy about the loss of viewing wild animals on the winter range of the proposed expansion (FWP 1997f).

Approval of the expansion would increase time and expenses spent by FWP and DoL personnel inspecting, monitoring, and responding to complaints about operation of the Ranch or egress/ingress problems. If FWP or DoL are unable to hire additional employees to handle the increased workload that could potentially be created by the expansion, the activities of existing staff would need to be re-prioritized to meet the increased demand created by expanding the existing operation. In addition, available deer and elk hunting permits in the Rye Creek area may increase initially to reduce the concentration of big game on available winter range, and may decrease in the long term as fewer wild game are present in the area.

The Proposed Action would replace 100 publicly-owned wild elk with 300 privately-owned domestic elk. Harvest of these elk would shift from control of the State of Montana to the control of the domestic herd owner. This action would result in decreased hunting in the area and potential loss of dollars into the local economy as a result of non-local hunters shifting to other areas to hunt. Some of this monetary loss would be offset by an increase in paying clients at the BVR which would result in additional money spent in the local economy. A reduction in the number of wild game could result in a reduction in the number of elk and deer hunting permits offered by FWP for the Rye Creek area.

No additional revenues in property taxes would be realized as a result of the expansion since

parcels of land with 160 acres or more are classified by the county as agricultural land and have the lowest appraisal value (Spear 1997). If the BVR increased the number of mature elk or deer (i.e., 24 months or older) on the property, there would be an increase in personal property tax. Based on the current Darby mill levy of 300.61, the county would receive an estimated \$9.32 per mature bull elk, \$4.51 per mature cow elk, and \$6.01 per mature deer, while the state would collect \$12.00 per animal in personal property taxes (Richards 1997). Additional state income tax would be collected from the BVR for the two new employees that would be added for the Proposed Action.

Alternative A: Proposed Action with Mitigation Measures

Implementation of mitigation measures under Alternative A would result in impacts similar to those described for the Proposed Action. Those who oppose the expansion may sense a feeling of relief that mitigation measures were being imposed on operation of the expansion area. Residents who perceive the mitigation measures as infringing upon the rights of property owners may be upset that governmental agencies imposed such measures as part of approval of the expansion.

No Action Alternative

Although there would be no expansion with the No Action Alternative, some social impacts have already occurred as documented through the EIS process and management practices of the existing operation. The potential of approving the expansion may have fractionalized some segments of the community based upon support or opposition to the expansion. Denial of the expansion would be welcomed by those who oppose it and, as a result, they may consider the quality of their lives was preserved. Ill feelings, however, may be harbored by people who favor the expansion which, in turn, may increase the social distance between individuals or groups opposing and favoring the expansion.

CULTURAL RESOURCES

DIRECT AND INDIRECT IMPACTS

No cultural resources have been recorded in the area of potential effect (study area). No adverse impacts to cultural resources would be expected to occur as a result of the Proposed Action or alternatives.

ANALYSIS OF IMPACTS TO PRIVATE PROPERTY

This section provides an analysis of impacts to private property by proposed restrictions or stipulations (Alternative A: Proposed Action With Mitigation Measures) as required under 75-1-201, MCA. The analysis provided in this EIS was conducted in accordance with implementation guidance issued by the Montana Legislative Services Division (EQC 1996). It contains a discussion of benefits to be derived from imposing the stipulations, types of expenditures the stipulation would require, how the market value of the property would be affected, a qualitative description of the economic impact of implementing the stipulations, and alternatives to stipulations listed in Alternative A.

Implementation of erosion control best management practices (BMPs) for roads and road maintenance. Apply BMPs described in the publication, Montana Forestry BMPs (DEQ 1991). These BMPs include specifications for road locations, use of culverts, runoff and sediment control, stream protection by establishing streamside management zones, waste management, and reclamation. This mitigation measure would reduce impacts on soil and water resources by reducing erosion. This restriction would positively affect the market value

of the property because it would improve surface water quality and road conditions. The restriction would require additional expenditures to maintain runoff control on roads. Implementing road BMPs could have a positive economic impact to BVR during wet seasons when roads without BMPs require more maintenance. It may have a negative economic impact to BVR during dry years. The alternative to this stipulation is to implement limited BMPs or no BMPs.

Install a double fence around the perimeter.

Construct a double fence with a minimum height of 10 feet for one fence and 9 feet for the other fence with a year-around effective height of 8 feet. Location of double fence and height requirements would be determined by FWP. This impact analysis assumes a double fence around the north, east and south sides of the proposed expansion area. The existing electric fence is an experimental fence and has been determined to be ineffective and difficult to maintain. This mitigation measure would reduce impacts to wildlife by reducing the risk for disease transmission and hybridization through ingress and egress events. This restriction would have a positive effect on the market value of the property if it were sold as a game farm, and either no effect or negative effect if it were sold as residential property. Installing a double 10-foot tall fence would have a significant negative economic impact to BVR because it would more than double the cost of the proposed fence, already a significant expenditure by BVR. The alternative to this stipulation is to install the proposed single fence that would be 9 feet tall.

Prepare and implement an Ingress/Egress Response Plan. This mitigation measure would reduce impacts to wildlife resources through game farm management procedures preapproved by FWP. This restriction would not affect the market value of the property and would require additional expenditure of time and money to develop an adequate plan. This restriction would have a slight negative economic impact to BVR. The alternative to this stipulation is to manage ingress and egress events on a case-by-case basis.

Fence riparian areas out of the grazing system.

This mitigation measure would reduce impacts to water, vegetation and wetland and riparian resources by protecting riparian areas and surface water from disturbance by game farm animals. This restriction would positively affect the market value of the property by preserving riparian areas and protecting surface water quality. The restriction would require significant additional expenditures to install adequate fencing and would have a negative economic impact to BVR from the cost of fencing and providing additional water. The negative economic impact may be recovered when the property is sold. The alternative to this stipulation is to leave riparian areas accessible to game farm animals.

Transport game farm animals across Rye Creek Road by vehicle. Transportation of game farm animals from the contained area north of Rye Creek to the quarantine and handling area south of Rye Creek by vehicles instead of through a gate across Rye Creek Road would decrease the frequency and/or duration of Rye Creek Road closure at the gate and would reduce the risk to wildlife resources by reducing ingress and egress events. Additional holding and handling facilities would be required for this mitigation measure. This restriction would not affect the market value of the property and would require minimal additional expenditures. This restriction would have a negative economic impact to BVR because it would require additional time for employees to load and unload the animals. The alternative to this stipulation is to walk game farm animals across the road as proposed.

CUMULATIVE EFFECTS

This section of the EIS summarizes cumulative environmental effects on resources in the BVR game farm area that could result from the Proposed Action. As stated in the Administrative Rules of Montana (ARM) 12.2.429 (7), "*cumulative impact*" means the collective impacts on the human environment of the Proposed Action when considered in conjunction with other past and present actions related to the

proposed action by location or generic type. Related future actions must also be considered when these actions are under concurrent consideration by any state agency through pre-impact statement studies, separate impact statement evaluation, or permit processing procedures."

Cumulative effects address direct and indirect impacts of resources described earlier in this chapter. Direct and/or indirect impacts were not identified for geologic, paleontological, air, and cultural resources; therefore, these resources are not included in the cumulative effects analysis. Cumulative effects analysis does not consider mitigation which may be required by FWP or other agencies for individual actions.

The geographic area addressed in the cumulative effects analysis varies depending on the resource being discussed. The cumulative effects area is generally defined by the entire Rye Creek watershed and the portion of the Bitterroot watershed that is affected by confluences with the Deer Hollow and Rye Creek drainages (**Figure 4-1**). It is herein referred to as the general cumulative effects area.

PAST, PRESENT AND FUTURE ACTIVITIES

The significant past and present land uses in the general cumulative effects area include the BVR existing game farm, extensive timber harvesting on federal and private land, and home building. Future land use in the cumulative effects area is expected to be similar to the past, with more construction of residential homes and associated road building activities.

The BVR is the latest in a series of ranching operations that has attempted to derive a living from the existing game farm and surrounding property. Historically, finding adequate forage has been a challenge on the ranch, contributing to the failure of several ranching operations over time. The present owner purchased the ranch in bankruptcy (BVR 1997c). Few or none of the recent ranch owners coordinated with federal and local resource management agencies to improve vegetation and control weeds (Bower 1997).

Presently, the ranch has no conservation plan on file with the Natural Resource Conservation Service, and is not involved in any weed control activities (Robertson 1997; BVR 1997a). Wells have been drilled in the BVR existing game farm to provide water for elk away from the creeks. The expansion area and adjacent ranch lands are platted for subdivision into 10- and 20-acre ranchettes and land outside the expansion area is currently for sale (BVR 1997c).

WATER RESOURCES

The cumulative effects study area for water resources includes the entire Rye Creek and Deer Hollow watersheds, and areas surrounding the Bitterroot River near the Rye Creek confluence (**Figure 4-1**). Historically, a considerable amount of logging has been conducted in the cumulative effects area. Ranching and cattle grazing occur within the study area, although only minor grazing occurs within the Rye Creek drainage. The Bitterroot Valley in this area continues to be subdivided, including areas immediately surrounding the BVR site. Road and home construction eliminate vegetation in discrete locations.

The existing BVR game farm has experienced some of the impacts previously described for the Proposed Action. The holding pen area located south of Rye Creek are nearly devoid of vegetation, making them susceptible to erosion. Lowman Creek was subjected to erosion and sedimentation problems in the spring of 1994 when high runoff flows breached several earthen dams used as watering sites for elk on the existing BVR game farm. The BVR is currently restoring affected areas in the drainage. Rye Creek is fenced within the BVR area so that game farm animals cannot directly access the stream.

All of the activities described above contribute to increased erosion and sedimentation to Rye Creek and the Bitterroot River. Best management practices and restoration activities in some areas are helping to minimize impacts and restore problem sites. The proposed BVR expansion is not expected to contribute significantly to cumulative impacts on water resources within the study area. However the cumulative impact of the

entire game farm and expansion area would adversely impact water resources by continuing to introduce sediment to surface water.

SOIL RESOURCES

The cumulative effects area for soil resources is the Rye Creek watershed and a portion of the Bitterroot River as shown in **Figure 4-1**. In general, soil in the cumulative effects area is of poor quality due to high coarse fragment content, low organic matter content, and low water holding capacity.

Activities that have exposed soil and resulted in soil erosion in the past 5 years in the cumulative effects area include: approximately 8,000 acres of land disturbed by timber cuts, yielding approximately 52 MMBF of lumber (1992 - 1996), 2,097 acres of the existing BVR game farm, and acreage disturbed by development of residential home sites and associated road building.

Cumulative impacts would result primarily from water erosion. Losses from erosion would decrease following forest and other vegetation recovery.

VEGETATION RESOURCES

The cumulative effects study area for vegetation is shown in **Figure 2-1**. Implementation of the Proposed Action would adversely effect vegetation resources within the study area. Significant vegetation and soil degradation would continue on the permitted operation (1,944 acres), and the expansion area (1,100 acres) would be subject to similar degradation. Both areas would experience a reduction in species diversity and habitat loss. The surrounding winter range would be heavily impacted as wildlife is crowded onto increasingly smaller areas.

Winter range in the Bitterroot Valley continues to be subdivided or advertised for development as game farms (Hall 1997). Subdivision of the expansion area and adjacent holdings of the BVR could result in significant vegetation overutilization and increases in weed populations and diversity, depending on wildlife use in combination with

livestock presence and management on ranchettes. Road and home construction would result in permanent elimination of vegetation at discreet locations.

WETLAND AND RIPARIAN AREAS

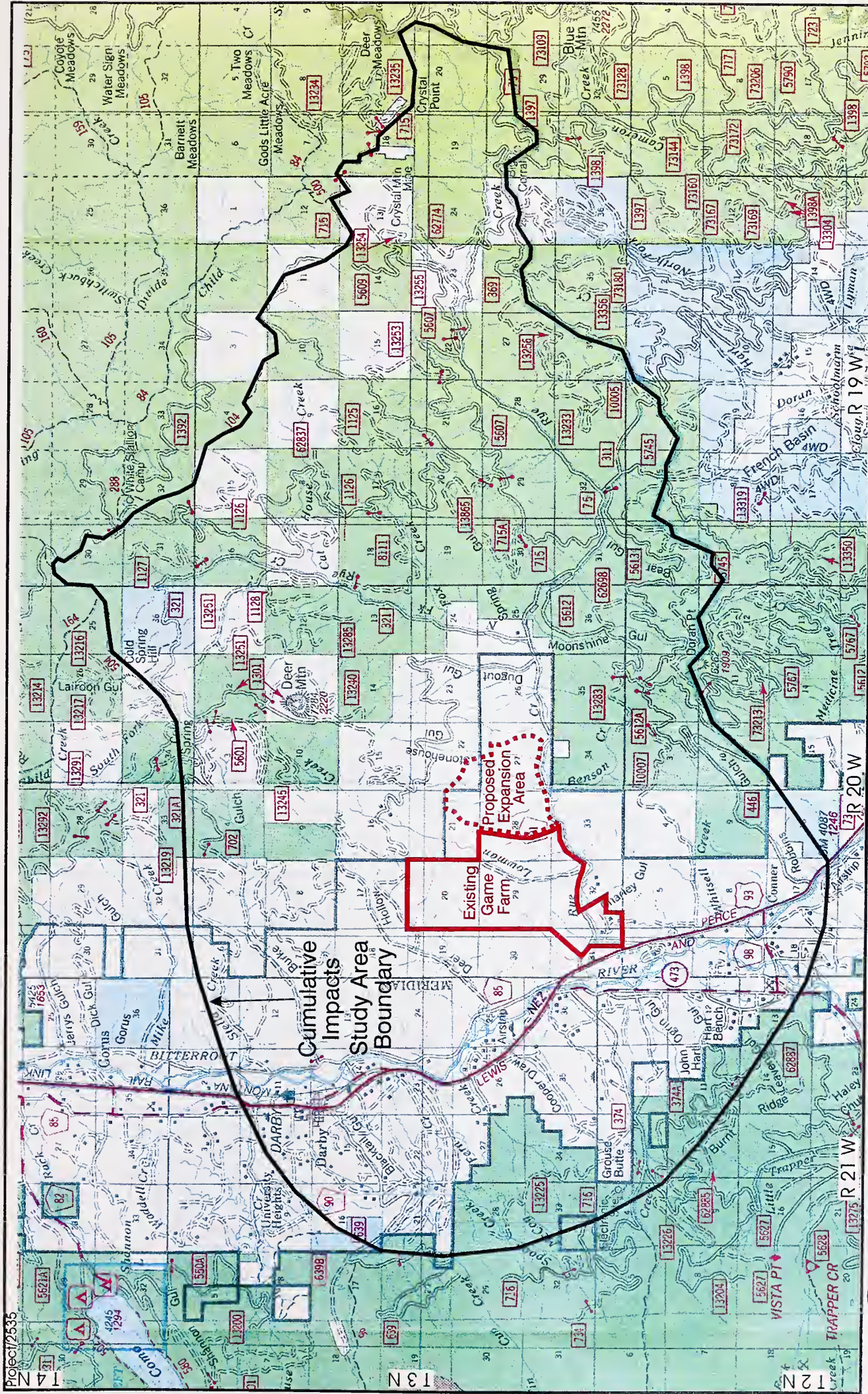
Past and Present Activities

Existing shrubs and trees in Lowman Creek are severely browsed, and reclamation without excluding elk from the drainage is doubtful (Durrant 1997). A fence has been constructed on the west side of the drainage within 100 feet of the creek, forming a pasture the length of the creek on the east side of the permitted area. All elk have access to Lowman Creek from April through September. A portion of the herd utilizes Lowman Creek all year, but use is somewhat restricted because elk would damage trees and shrubs by eating bark during winter months (BVR 1997a). Elk are provided supplemental feed year-round in the permitted area. Some wetland and riparian areas were impacted by erosion and sedimentation in the spring of 1994 when several earthen dams washed out.

A road is located immediately adjacent to Jeep Trail Creek providing a source of sediment to the creek. Shrubs in the bottom of Jeep Trail Creek show moderate browse activity. Logging of cottonwood trees and aspen has occurred in the drainage bottom (BVR 1997c) which has contributed to sedimentation.

Logging has occurred in upper Jeep Trail Creek and Lowman Creek (BVR 1997c), contributing to sediment loading in both drainages. Rye Creek and North Fork Rye Creek have also experienced significant logging activity (FWP 1997g). Rye Creek, while fenced from the present BVR operations, receives runoff from pens adjacent to Rye Creek.

No additional logging is planned on upper Jeep Trail Creek or Lowman Creek on BVR property. There are no plans to fence elk out of the bottom of Lowman Creek (BVR 1997c). The expansion area would be divided into three pastures;



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From USDA Forest Service Bitterroot National Forest

Study Area for Water Quality and Wildlife Resources Cumulative Impacts
 Proposed Expansion EIS
 Big Velvet Game Farm Ranch
 Ravalli County, Montana
 FIGURE 4-1

however there are no plans to exclude Jeep Trail Creek from the pastures (BVR 1997c).

Historic and recent logging activity, heavy utilization of wetland/riparian vegetation along Lowman and Deer Hollow creeks, ongoing erosion due to grazing in the permitted area, and sedimentation of streams due to lack of vegetation or debris from breached water impoundments combine to adversely impact wetland/riparian habitat in the study area. Proposed grazing in the expansion area would negatively impact both upland and wetland/riparian vegetation, and result in increased use of adjacent winter range by deer and elk. Wetland and riparian areas in the proposed expansion area are relatively small within the context of the cumulative effects study area.

WILDLIFE AND FISHERIES RESOURCES

The cumulative effects study area for fish and wildlife resources is the Rye Creek watershed and the Bitterroot River near the confluence with Rye Creek (**Figure 4-1**). The expansion of the existing game farm, in addition to past, present and reasonably foreseeable activities in the study area, would result in cumulative impacts to fish and wildlife resources due to habitat partitioning, loss of winter range, increased risk from disease and hybridization, and loss of fish spawning habitat. Past, present and reasonably foreseeable activities include the existing BVR game farm, proposed BVR expansion, logging activities in the upper watersheds, and a proposed subdivision east and north of the expansion area.

During severe winters, mortality of wild elk would be expected to occur that is directly attributable to the existing fencing, the proposed expansion area fence, and the loss of adequate winter range to support the existing herd. Fencing the BVR existing game farm and expansion area would force wild elk to cross four high ridges and four valleys to travel from the east side of the Rye Creek winter range to the west side. During periods of heavy snow cover and cold temperatures, this would place extra energy demands on elk trying to meet their daily nutritional requirements. Wild game that did

reach the west side of the game farm are unlikely to find adequate winter range.

Cumulative impacts from loss of winter range would be more severe for wild deer than for elk. Numerically, more mule deer are dependent upon the Rye Creek winter range than wild elk and mule deer are less capable than elk in severe winter weather to disperse to marginal areas or to cross high ridges and valleys. Mule deer are smaller and may encounter snow depths at higher elevations that exceed their physical capabilities to travel through. The existing game-proof fencing together with the proposed expansion area fencing would be expected to increase the opportunity for coyote and mountain lion predation on wild mule deer during winter. In order for mule deer to escape coyote and mountain lion predation, adequate flight distances need to be available. Game-proof fencing can block or reduce mule deer escape routes below a critical value.

The existing game farm and proposed expansion would exclude wild game from about 75 percent of Rye Creek winter range. Completion of a proposed subdivision located adjacent to the east side of the expansion area would also eliminate part of the remaining critical winter range for mule deer in the Rye Creek watershed. Winter range divided into 10- and 20-acre parcels is capable of supporting mule deer but at a lower density than undeveloped land. This cumulative loss of 75 percent of Rye Creek winter range by the BVR game farm coupled with the use of the remaining Rye Creek winter range as a subdivision, would likely result in a long term reduction of the Rye Creek mule deer herd by 450 to 700 head. This response may not be immediate and may take several years for the Rye Creek wild game herds to respond, depending on winter severity. Wild game could also compensate for lost winter range by increasing their use of adjacent agricultural lands. Implementation of the Proposed Action may cause FWP to issue post-season permits for a special hunt of Rye Creek mule deer which would increase the number of hunting permits by 400 to 600 head for a special hunt. Elk would be expected to find alternative winter range and are not likely to suffer significant herd loss from the cumulative effects of activities in the study area.

The existing game farm and proposed expansion would increase the risk of transmission of harmful diseases to wild game for the same reasons described under the discussion of direct and indirect impacts to wildlife. In addition, BVR regularly imports game farm animals to replace bull elk killed during game farm hunts and elk sold as breeding stock. In 1996, 78 bull elk were shot by game farm clients and 34 elk were sold as breeding stock. Importation of game farm animals to replace killed or sold elk increases the risk of introducing disease to the existing herd. The cumulative effect of managing over 3,000 acres and 1,100 elk would compound the risk because the aerial extent of the game farm, number of animals and steep terrain decrease the ability of the operators to exercise consistent good husbandry practices and effective monitoring of the entire herd (i.e., tagging and marking requirements) and containment structures.

The history of ineffective fencing at the existing game farm indicates that the cumulative impact of the existing game farm and Proposed Action would result in a higher risk for transmitting harmful diseases from captive to wild animals and in mixing and breeding with local wildlife populations than the risk would be with a more effective fence. Previous ingress events have occurred and would likely continue to occur. The existing perimeter fences and the fences proposed for the expansion area do not prevent nose-to-nose contact or animal ingress. Elk contacting the fence with their nose were observed during a recent field reconnaissance (FaunaWest 1997). Perimeter electrical wires have been observed as inactive during inspections except those by administrative buildings (DoL 1997a, FaunaWest 1997). Previous events in the existing game farm indicate that fence height provides inadequate containment. Ingress events have occurred in the past (20 deer in a 5-year period; FWP 1997h). Some ingress events have been the result of inadequate effective fence height due to heavy snow accumulation and some due to crawl space under the fence created by runoff washouts. Ingress of deer has also occurred by jumping over the fence when there is no snow (FWP

1997h). Based on past occurrences, it is reasonable to predict that without improvements in fence construction and maintenance, frequency of ingress and egress would increase.

The combined effects of existing conditions and the proposed BVR expansion could result in sedimentation and storm water runoff that would adversely impact aquatic insect larvae habitat, spawning success of fishes downstream. This may cause a shift in species composition to sediment tolerant aquatic insects and fishes. Additional sediment loading from the proposed expansion area is not expected to cause significant effects on fish resources because of the ephemeral nature of flow from this area. Most sediment problems to Rye Creek in the BVR area have occurred from the existing BVR facilities. Considering that the existing conditions have only been in place a few years, ample time has not elapsed to document impacts of the existing conditions on sensitive fish species in Rye Creek and immediately downstream in the Bitterroot River.

THREATENED, ENDANGERED AND CANDIDATE SPECIES

The cumulative impacts area for threatened, endangered and candidate species is shown in **Figure 4-1**. Minor impacts of the Proposed Action and existing operation to individual bald eagles would include moving to other winter ranges for scavenging carrion and reducing the occurrence of bald eagles on the Bitterroot River near its confluence with Rye Creek due to loss of fishery in that drainage. The cumulative effects of the existing BVR game farm, timber harvesting, and road and house construction in the study area would result in increased sedimentation of surface water and loss of winter range. This would result in the same impacts to threatened, endangered and candidate species described under direct and indirect impacts.

LAND USE

The cumulative effect on land use in the general cumulative effects area (**Figure 4-1**) would be to

reduce the number of available wild game for non-game farm hunting and increase road safety hazards. The reduced number of wild game available for hunting would result from loss of winter range habitat due to the existing and proposed game farm enclosures, and loss of summer range habitat due to past, present and future timber cuts on private land in the Sapphire Mountains. The increase in safety hazard would be due to an increase in the frequency or duration of closure of Rye Creek Road to accommodate a 38 percent increase in the number of game farm animals managed at BVR as a result of the Proposed Action and a potential increase in wild game on the county road as they attempt to migrate around the game farm.

VISUAL RESOURCES

The cumulative effect on visual resources in the general cumulative effects area would be changes in the natural landscape due to fencing, road building, over-utilized vegetation, and construction of new homes.

SOCIAL AND ECONOMIC RESOURCES

Cumulative effects to socioeconomic resources would be similar to those described under direct and indirect impacts.

CHAPTER 5

CONSULTATION, COORDINATION, AND PREPARATION

PUBLIC PARTICIPATION SUMMARY

INTRODUCTION

Public participation specific to the BVR expansion proposal is summarized in this chapter. This summary includes means of public involvement, identifies persons and organizations to be contacted for comments and feedback, and specifies time-frames for accomplishing goals in accordance with Administrative Rules of Montana (ARM) Title 12, Chapter 2, Subchapter 4.

Public involvement in the EIS process includes the necessary steps to identify and address public concerns and needs. The public involvement process assists in (1) broadening the information base for decision making; (2) informing the public of the proposal and long-term impacts resulting from the action; and (3) ensuring that public needs and desires are understood by FWP.

Opportunities for participation and public notices are required at four specific points in the EIS process: the scoping period, review of the Draft EIS, review of the Final EIS, and receipt of the Record of Decision.

- **Scoping:** The public is provided a two-week scoping period to identify potential issues associated with the Proposed Action that might warrant analysis during development of the Draft EIS.
- **Draft EIS Review:** The 30-day Draft EIS review is initiated by publication of a Notice of Availability for the Draft EIS in the local newspapers. During the review period, a public hearing will be held in Hamilton, Montana to obtain comments.
- **Final EIS Review:** The 15-day Final EIS review is initiated by publication of a Notice of Availability for the Final EIS in local newspapers.

- **Record of Decision:** Subsequent to the 15-day review of the Final EIS, the Record of Decision will be prepared and a Notice of Availability for the Record of Decision will be published in local newspapers.

IMPLEMENTATION

The six items listed below outline the necessary components used to implement the public participation process.

1. Public Scoping Period and Meetings

Publication of a Notice of Intent initiated the scoping period on Thursday, February 14, 1997 (*Missoulian* and *Ravalli Republic*). The public notice stated the Proposed Action and the date and time of the public scoping meeting. A public scoping meeting was held in Hamilton, Montana on February 19, 1997. The scoping meeting was attended by approximately 60 people; 30 oral comments were received during the meeting. Scoping comments were accepted until March 1, 1997. During that period, FWP received 28 written comments from individuals and groups. The scoping meeting was recorded verbatim and a record of that recording and all written comments are available for review at the FWP office in Missoula.

2. Public Scoping Report

FWP compiled a Public Scoping Report for distribution to interested persons. Upon written request, the Public Scoping Report can be obtained from the Missoula FWP office.

3. EIS Mailing List

An EIS mailing list of interested persons was assembled from a previous expansion Environmental Assessment prepared for BVR. This list was supplemented by names from the public meeting sign-in sheet and written comments received during the scoping process

and will be continuously updated as needed throughout the EIS process.

4. Distribution of the Draft EIS

The Draft EIS will be distributed as follows:

- A Notice of Availability will be published in the *Missoulian* and the *Ravalli Republic* specifying the dates for the comment period and the dates, times, and locations of a public hearing.
- A news release will be provided by FWP at the beginning of the 30-day comment period. The news release will be submitted to all relevant news outlets.
- The Draft EIS will be distributed to interested parties identified on the updated EIS mailing list.
- Letters received from interested parties concerning the Draft EIS will be promptly acknowledged so respondents will know their comments have been received by FWP.
- A public meeting will be held in Hamilton to obtain comments on the Draft EIS. The meeting will take place after publication of the Draft EIS notice. The meeting will be noticed in local newspapers and through news organizations.
- Briefings will be offered for local and state government representatives as requested.

5. The Final EIS Distribution

The Final EIS will be completed considering comments from review of the Draft EIS and released as follows:

- A Notice of Availability will be published in the *Missoulian* and *Ravalli Republic*.
- Copies of the final document will be sent to those on the updated mailing list.

- A news release will be issued to all relevant news outlets throughout the Bitterroot Valley.

6. Record of Decision

The Record of Decision will be distributed to people and organizations on the updated mailing list, and a Notice of Availability will be published in the *Missoulian* and *Ravalli Republic*. A news release will be issued to all relevant news outlets to announce distribution of the Record of Decision.

CRITERIA AND METHODS BY WHICH PUBLIC INPUT IS EVALUATED

Letters and testimony concerning the Draft EIS will be reviewed and evaluated by FWP to determine if information is presented that requires a formal response or contains new data to be brought to the attention of the FWP which identifies deficiencies in the Draft EIS. Steps would then be initiated to correct such deficiencies and to incorporate the information into the Final EIS.

Should changes from the Draft EIS to the Final EIS be deemed significant, FWP will review the need to reissue a Draft EIS, prepare a supplemental EIS, or prepare a Final EIS.

CONSULTATION WITH OTHERS

The following local, state and federal agencies were consulted during preparation of the EIS:

- Bitterroot Conservation District
- Ravalli County Road Department
- Ravalli County Weed Control District
- Montana Department of Livestock
 - Animal Health Division
 - Brands Enforcement Division
- Montana Department of Natural Resources and Conservation
 - Forestry Division
 - Water Resources Division
- Montana Department of Environmental Quality
 - Enforcement Division
 - Remediation Division
 - Permitting and Compliance Division
- Montana State Historic Preservation Office
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service.
- Montana Department of Agriculture

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BVR Owner/Operator/Proposed Action

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